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Appendix II-A

DRAFT
# AIR QUALITY MANAGEMENT PLAN
# 1988 REVISION

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# APPENDIX II—A
# 1985 SUMMARY OF AIR QUALITY IN CALIFORNIA'S SOUTH COAST AIR BASIN



SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT

MARCH, 1988

89 003303
Appendix II-A

# 1985

# SUMMARY of AIR QUALITY in California's South Coast Air Basin

December 1986

SOUTH COAST
AIR QUALITY MANAGEMENT DISTRICT
9150 Flair Drive, El Monte, 91731

*SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT*

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## SUMMARY

### Comparison to Standards

In this report 1985 air quality in the South Coast Air Basin is compared to the state and federal ambient air quality standards, and may be briefly summarized as follows:

- lead and sulfur dioxide - concentrations met standards at all Basin locations in 1985.
- nitrogen dioxide and sulfate - standards exceeded infrequently and only in portions of Los Angeles and Orange counties.
- carbon monoxide - standards exceeded in about one-fourth of the Basin, with the high area in coastal/central L.A. County.
- ozone and suspended particulate - standards exceeded throughout the Basin. Highest concentrations for both were observed in the inland valley areas of Eastern Los Angeles County and neighboring parts of Riverside and San Bernardino counties.

### 1985 Basin Maxima

The maximum concentrations measured in the South Coast Air Basin in 1985 were:

| Pollutant | Basin Maximum Concentration (Averaging time) | Location of Basin Maximum |
|---|---|---|
| Ozone | .39 ppm (1-hour) | Glendora |
| Carbon monoxide | 33. ppm (1-hour) | Lynwood |
| Nitrogen dioxide | .35 ppm (1-hour) | Long Beach |
| Sulfur dioxide | .08 ppm (1-hour) | Long Beach |
| Total suspended particulate | 392 ug/m$^3$ (24-hour) | Reseda |
| Lead | .91 ug/m$^3$ (24-hour) | Lynwood |
| Sulfate | 31 ug/m$^3$ (24-hour) | Long Beach |

A more detailed overview of the Basin's current air quality in terms of state and federal standards is given in Table I of the Appendix.

## Trends in Air Quality

Three year multi-station averages of the annual or seasonal average concentrations of these pollutants at key locations are compared for the periods 1975-1977 abd 1982-1984. All showed a decrease over the period as follows:

| Pollutant | Statistics | Number Stations | Percent Change 1975-77 to 1982-84 |
|---|---|---|---|
| Ozone | May-Oct. avg. daily maximum 1-hour | 6 | -7 % |
| Carbon monoxide | Jan., Feb., Oct., Nov., Dec., avg. daily max. 1-hour | 6 | -31% |
| Nitrogen dioxide | Annual average | 6 | -19% |
| Total suspended particulate | Annual average | 8 | -7% |
| Lead | Maximum quarterly average | 1 | -85% |
| Sulfate | Annual average | 9 | -9% |

## Basin Compared to U.S. Air Quality

In 1985, for four of the six federal criteria contaminants (lead, sulfur dioxide, carbon monoxide, and suspended particulate), the federal standards were exceeded by a greater margin and more frequently in other areas of the U.S. For ozone and nitrogen dioxide, standards were exceeded most frequently and by the greatest margin at locations within this Basin. Meteorological conditions in the Basin are highly conducive to ozone formation, with the result that Basin ozone concentrations are the highest in the U.S., despite the fact that emissions controls are more stringent than those applied elsewhere in the U.S.

## Seasonal and Diurnal Variation

Pollutant concentrations vary both seasonally and diurnally, and these variations are particularly marked for ozone and carbon monoxide. In the inland valleys, which typically have the Basin's highest ozone, concentrations tend to be higher in the summer than in winter. The concentrations at night are generally very low, climbing after sunrise to an afternoon peak and then dropping off rapidly thereafter. Variations in pollutants other than ozone and carbon monoxide are less well defined and may vary with location.

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## INTRODUCTION

### AIR QUALITY OVERVIEW

Although overall air quality in the South Coast Air Basin of Southern California has shown improvement in recent years, levels of two pollutants, ozone and nitrogen dioxide, are still the highest in the United States.

Meteorological conditions in the Basin are more conducive to photochemical pollution formation than those in any other large urban area in the nation. As a result, increasingly stringent pollution controls have been placed on industrial sources in Los Angeles County since the late '40s and in the other three Basin counties since the '50s. California was the first state in the country to require controls on motor vehicles.

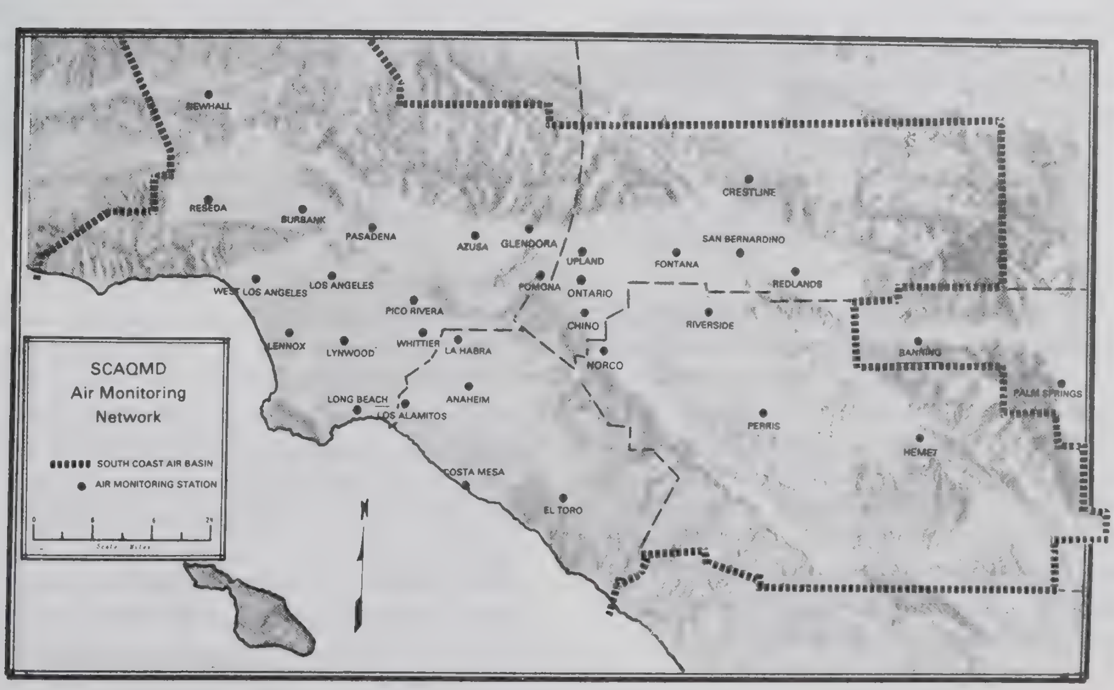
Because of these controls, there has been a gradual decline in atmospheric pollutant concentrations, despite a 125 percent population increase between 1950 and 1980. By the '80s, peak ozone levels had dropped more than 30 percent from the highs recorded in the '50s and by 1985 all stations in the Basin were in compliance with state and federal standards for lead and sulfur dioxide.

### South Coast Air Basin

The Basin consists of the non-desert portions of Los Angeles, Riverside, and San Bernardino counties and all of Orange County. Its area is approximately 6,600 squares miles. The 1980 census showed a population of 10.9 million, with 7.4 million people concentrated in the Los Angeles County portion.

The Basin is bounded on the west by the Pacific Ocean, on the north and east by the San Gabriel, San Bernardino, and San Jacinto Mountains, and on the south by the San Diego County line (Figure 1.)

FIGURE 1



## South Coast Air Quality Management District

With the exception of regulations on on-road vehicles, which are under the statewide jurisdiction of the California Air Resources Board, the South Coast Air Quality Management District is responsible for all air pollution control in the Basin. In 1985, the District maintained a network of 29 air monitoring stations in the Basin and 4 air monitoring stations in the Los Angeles and Riverside County portions of the Southeast Desert Air Basin (SEDAB).

## Emissions, Meteorology, and Air Pollution Potential

The South Coast Air Basin is an area of high air pollution potential, particularly from June through September. The poor ventilation afforded by generally light winds and shallow vertical mixing is frequently insufficient to adequately disperse the Basin's emissions. In addition, the plentiful sunshine, characteristic of the area, provides the energy to convert oxides of nitrogen and reactive organic gases (hydrocarbons and related compounds) into ozone, photochemical aerosols, and other pollutants.

Pollutant concentrations in the Basin vary with location, season, and time of day. Ozone concentrations, for example, tend to be low along the coast, higher in the near inland valleys and lower in the far inland areas of the Basin and adjacent desert. High ozone concentrations are most probable between May and October. On a day with high ozone levels, concentrations are typically near zero at night, rise rapidly after sunrise to an afternoon peak, and then drop off sharply to low levels at night.

## Effects of Air Pollutants

Individual pollutants in the Basin's atmosphere vary considerably in their impact on human health. Appendix Table II lists the observed health effects for specified concentrations of ozone, carbon monoxide, nitrogen dioxide, lead, and sulfur dioxide combined with particulate. It also lists the annual maximum contaminant concentrations in the Basin for 1985. In the discussion of contaminants, the typical seasonal and diurnal variation of the contaminants is presented (Section II of this report).

Pollutants may be damaging to plants and materials. Tables III and IV (appendix) briefly summarize some observed effects of air pollutants on plants and materials and the levels at which these occur.

## Air Quality Standards and Episode Criteria

The State of California and the federal government each have established air quality standards and emergency episode criteria for various pollutants (Appendix Tables V and VI).

Air quality standards are set at concentrations which provide a sufficient margin to protect public health and welfare. Episode criteria define air pollutant concentrations at which short-term exposures may begin to affect the health of that portion of the population especially susceptible to air pollutants. The health effects are progressively more severe and widespread as pollutant concentrations increase from Stage One to Stage Two and Stage Three Episode levels. The episode levels require specific actions by industry, the public, and the District (Appendix Table VI).

The following section of this report presents an analysis of 1985 data for each of the major pollutants monitored in the four-county area. The pollutants discussed are:

- ozone ($O_3$)
- carbon monoxide (CO)
- sulfur dioxide ($SO_2$)
- nitrogen dioxide ($NO_2$)
- total suspended particulate (TSP)
- suspended particulate matter (PM10)
- lead (Pb)
- sulfate ($SO_4^=$)
- nitrate ($NO_3^-$)

Atmospheric concentrations of these pollutants are compared to state and federal standards. Information on the sources, properties, and effects of these pollutants, and on the seasonal and diurnal variation in the concentrations of each, is also presented. Air quality trends are examined, and the Basin's air quality is compared to that of other areas of the United States.

For detailed treatment of pollutant trends for individual Basin locations see the District report "Air Quality Trends in the South Coast Air Basin 1975-1984."

# SECTION II

# DISCUSSION OF CONTAMINANTS

The following information is presented for each contaminant:

- Basin maps showing number or percent of days in 1985 exceeding the state standard by area.
- Tables showing the number or percent of days on which the state standards, federal standards and episode criteria were exceeded, and the maximum concentrations reached in 1985 at every District station in the South Coast and Southeast Desert Air Basins.
- Figures showing seasonal and diurnal variation in pollutant concentrations.
- Discussion of trends in pollutant concentrations
- Comparison of Basin and U.S. air quality in terms of federal standards

When using the maps to estimate the air quality at a particular location, it is necessary to consider variations due to the effect of local pollution sources. Lead, carbon monoxide and oxides of nitrogen ($NO_x$) are usually higher near heavily traveled roads than in areas with less traffic. Similarly sulfur dioxide is likely to be more concentrated near stationary sources such as power plants and petroleum refineries.

## OZONE

Ozone is a colorless, highly reactive gas with a sharp odor. It is formed by a complicated series of chemical and photochemical reactions involving reactive organic gases, oxides of nitrogen, and the oxygen in air. Industrial and mobile sources contribute about equally to the precursor emissions. Because photochemical reactions require sunlight to proceed, ozone formation is favored by strong solar radiation. Since the reaction rate depends on sunlight intensity, peak concentrations generally occur near the middle of the day. By the time the maximum ozone concentration is reached, the polluted air mass has usually been transported miles inland by the prevailing sea breeze. The high ozone area is therefore downwind of the major sources of ozone presursors.

Ozone ($O_3$) is much more reactive than normal atmospheric oxygen ($O_2$), and it is this reactivity which accounts for its damaging effects on materials, plants and health. In part due to the rapid reaction of ozone with materials such as rubber, plastics and fabrics, indoor concentrations are typically lower than outdoor concentrations.

### 1985 Ozone Air Quality

#### State Standard

The state air quality standard for ozone is a 1-hour average concentration equal to or greater than ($\geq$) 0.10 ppm (0.10 ppm=1/10 parts per million, or 1/10 of a volume of ozone per million volumes of air). If a single hourly average ozone concentration is $\geq$ 0.10 ppm during a day, the day is counted as one on which the standard was exceeded.

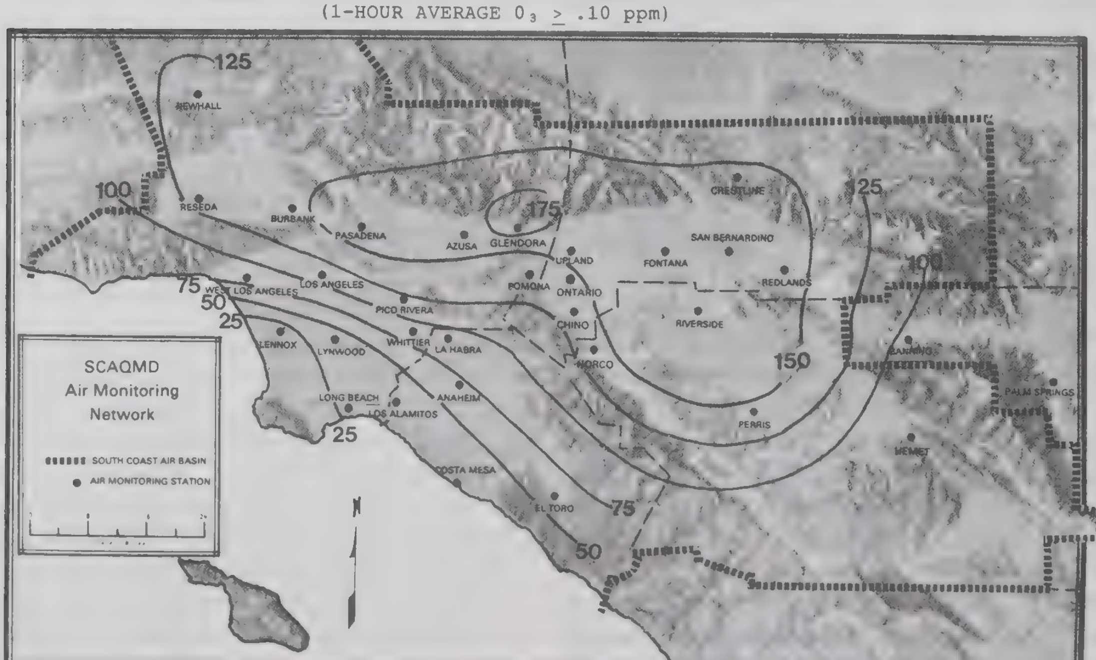
In Figure 2, the number of days in 1985 on which the state standard was exceeded in the different areas of the Basin is shown. The striped line indicates the boundary of the South Coast Air Basin, and the cities shown are the locations of the District's air monitoring stations. Contour lines have been drawn connecting locations at which the standard was exceeded on an equal number of days.

The state ozone standard was exceeded everywhere in the Basin in 1985, but least frequently in the coastal areas. The standard was exceeded most frequently in an area extending from the San Fernando Valley to the San Gabriel Valley and into the Riverside-San Bernardino area. In 1985 the greatest number of exceedances were at Glendora (187 days), Pasadena (173), and Rubidoux (173). The number of days on which the state ozone standard was exceeded, and the maximum 1-hour average for the year at each station are given in the Appendix Table VII.

## Federal Standard

The number of days on which the federal ozone standard (1-hour average $O_3 \geq .12$ ppm) was exceeded is given in Appendix Table VII. The federal standard was exceeded most frequently at Glendora (141 days), Fontana (126) and Rubidoux (125).

FIGURE 2
OZONE - 1985
NUMBER OF DAYS ON WHICH STATE STANDARD WAS EXCEEDED
(1-HOUR AVERAGE $O_3 \geq .10$ ppm)




- Less than 12 full months of data.
- Not measured at this location.

## Stage I Episode

The number of days in 1985 on which the Stage I Episode level (1-hour average $O_3 \geq .20$ ppm) was exceeded is shown in Figure 3. The episode pattern is similar to the standard exceedance pattern with the high area extending from the Eastern San Fernando Valley through the San Gabriel Valley into the Riverside-San Bernardino area. Stage I Episodes occurred most frequently at Glendora (68 days), Azusa (48) and Fontana (48).

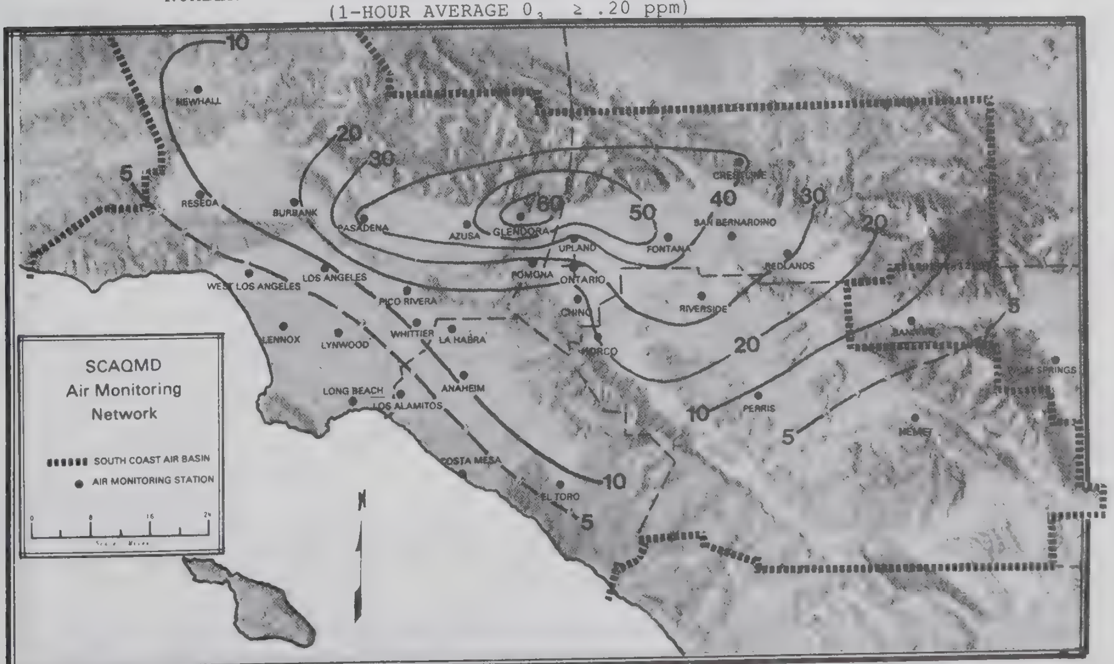
## Stage II Episode

Only five Basin locations had Stage II Episodes (1-hour average $O_3 \geq .35$ ppm) in 1985, with Glendora recording Stage II episodes on 5 days and Azusa, Pasadena, Rubidoux and Norco, on 1 day each. The highest 1-hour average ozone concentration of the year was .39 ppm, recorded at Glendora on August 24, 1985. The number of days on which Stage I and II Episodes were recorded for all stations for the years 1976-1985 is given in Appendix Table VIII, and the maximum concentration at each monitoring location for the years 1955-1985 is given in Appendix Table IX. Ozone is the only pollutant for which the Stage I Episode level is currently exceeded on more than 10 days annually in the Basin.

## Seasonal and Diurnal Variation in Ozone Concentrations

Because time is required for the precursor organic gases and oxides of nitrogen to react to form ozone, peak ozone concentrations usually occur from late morning through afternoon. By this time, sea breezes usually have moved the polluted air mass miles inland. For this reason, the highest concentrations usually occur downwind of, rather than in, the areas of heavy precursor emissions. Ozone concentrations are higher in summer than in winter since solar radiation is more intense and of longer duration, and temperature inversions are stronger and more persistent in summer. These seasonal and

FIGURE 3
OZONE - 1985
NUMBER OF DAYS ON WHICH STAGE 1 EPISODE LEVEL WAS EXCEEDED
(1-HOUR AVERAGE $O_3$ ≥ .20 ppm)




- Less than 12 full months of data.
- Not measured at this location.

---Intervals of 5.
——Intervals of 10.

diurnal patterns are illustrated in Figures 4 and 5.

Figure 4 shows the 1985 monthly averages of ozone at Glendora, which is located in the high ozone area of the Basin. The summer months experienced markedly higher ozone concentrations than the winter months, with the average in August being about 3.6 times that measured in December.

Figure 5 shows average ozone concentrations at Glendora for each hour of the day during summer and winter. In winter, the concentrations are low at all hours. In summer, following low nighttime concentrations, ozone increases rapidly after sunrise and peaks in the early afternoon. Even on the most heavily impacted days, ozone concentrations are usually quite low in the early morning. (More detailed discussion of diurnal variation in ozone concentrations by area is available in the District report "Seasonal and Diurnal Variations in Air Pollutant Concentrations, in California's South Coast Air Basin" published in December, 1980.)

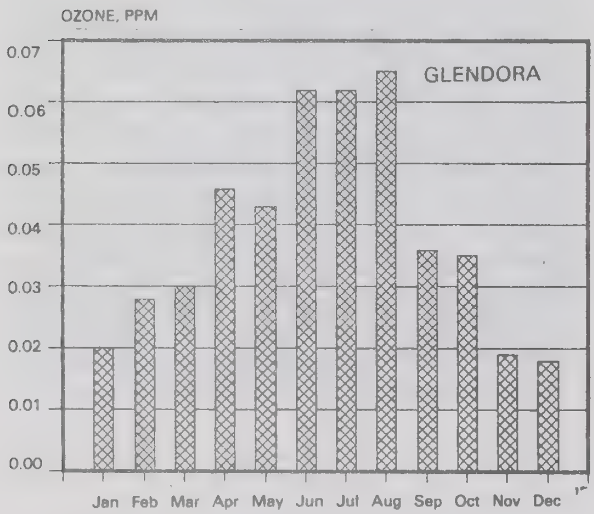



FIGURE 4. OZONE - SEASONAL VARIATION MONTHLY AVERAGES, 1985

## Trends

Ozone trends for the period 1975-1984 were examined for a six-station composite average ozone concentration.

The stations used to form the average were: Azusa, Pomona, Pasadena, Riverside, San Bernardino and Fontana. The 6-station average daily 1-hour maximum ozone for the period May-October showed a 4.6 percent decline from 1975 to 1984. A more statistically robust measure of the ozone trend is the 3-year running mean of this statistic, which increased between 1975-1977 and 1978-1980 and has shown a steady decrease since that time, with an overall decline of 7.2 percent from 1975-1977 to 1982-1984. Meteorological conditions were very similar for these two periods.

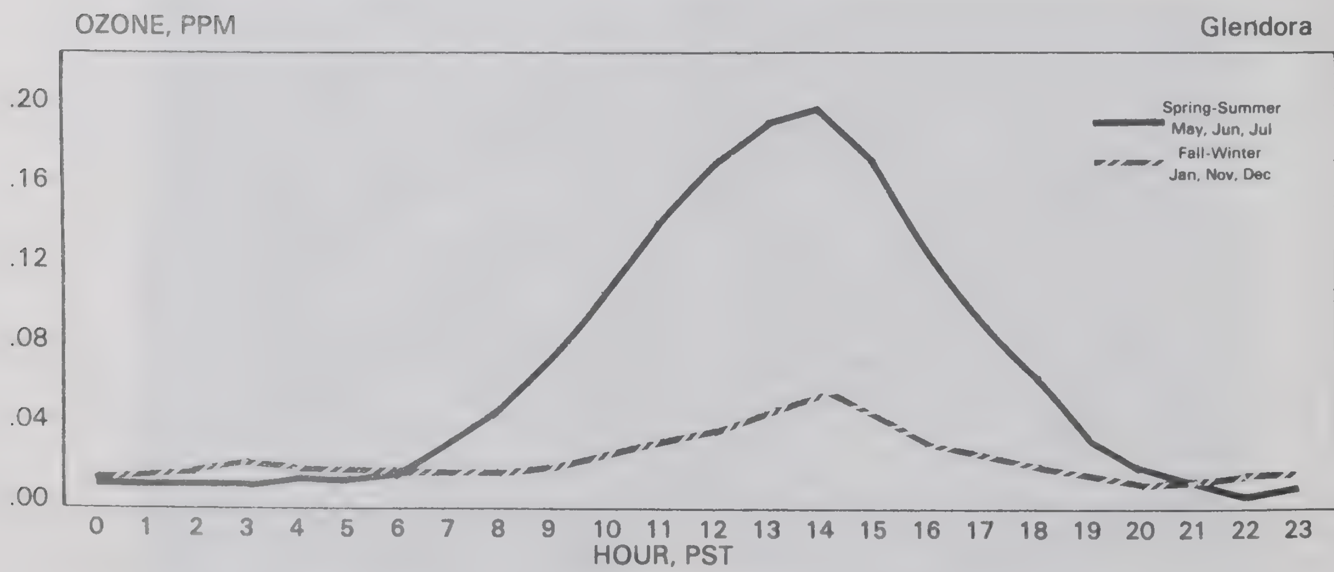



FIGURE 5. OZONE - DIURNAL VARIATION. AVERAGE FOR EACH HOUR, 1985

## Ozone - Comparison of Basin to Other Areas in the United States

The 1985 maximum ozone concentrations and the number of days exceeding the federal ozone standard in the ten largest urban areas in the U.S. are shown in Table X. The Los Angeles urban area exceeded the standard most frequently and had the highest annual maximum 1-hour average ozone concentrations of the ten areas.

In Table XI, the five U.S. counties with the greatest number of days exceeding the ozone standard and the five with the highest annual maximum 1-hour average ozone concentrations are listed. Los Angeles, Riverside, and San Bernardino counties led all the U.S. counties in both number of days exceeding the federal standard and maximum ozone concentration.

## CARBON MONOXIDE

Carbon monoxide (CO) is a colorless, odorless gas produced by incomplete combustion of carbon-containing fuels, such as gasoline. More than 90 percent of the CO in the atmosphere of the Basin is emitted directly from motor vehicles, so that CO concentrations are generally higher in the vicinity and slightly downwind of areas with heavy traffic.

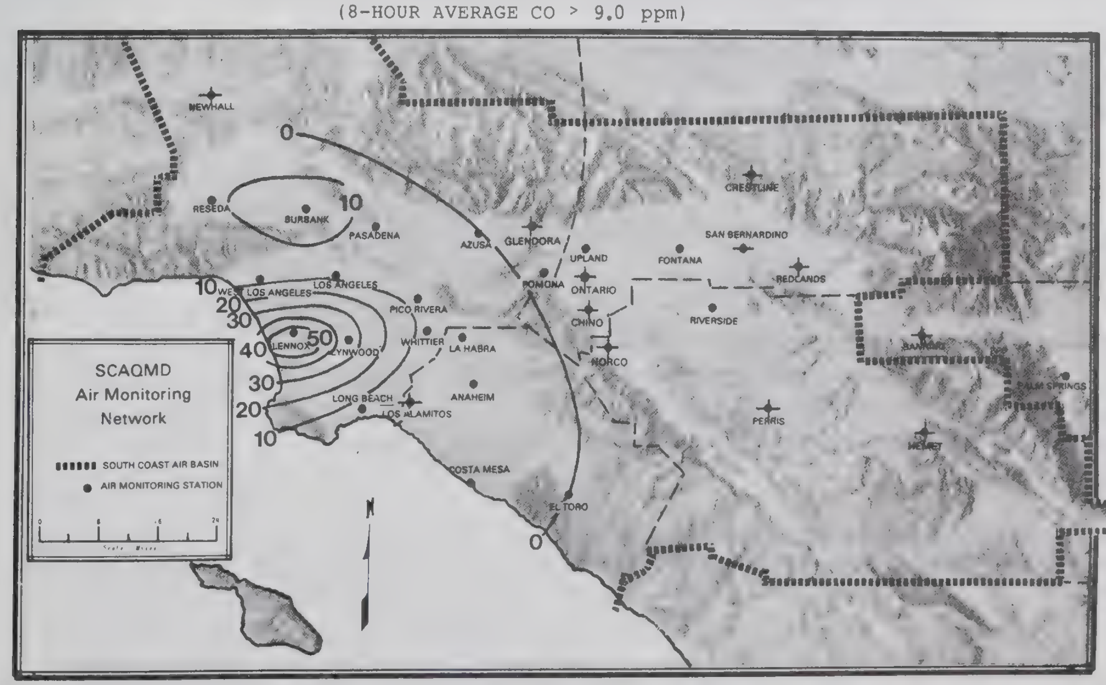
## 1985 Carbon Monoxide Air Quality

### State Standard

Figure 6 shows the number of days on which the state 8-hour standard (8-hour average CO> 9.0 ppm) for carbon monoxide was exceeded in 1985. The standard was exceeded in about one-fourth of the Basin and the high area was the heavily traveled portions of Los Angeles and Orange counties. The air quality standard was exceeded most frequently at Lennox (51 days), Lynwood (36), and Burbank (16).

The single highest 8-hour average concentration of the year was 27.7 ppm reported at Lynwood. The number of days on which the standard was exceeded and the 1-hour and 8-hour maxima for 1985 are given for each station in Appendix Table XII.

FIGURE 6
CARBON MONOXIDE - 1985
NUMBER OF DAYS ON WHICH STATE STANDARD WAS EXCEEDED
(8-HOUR AVERAGE CO > 9.0 ppm)




- Less than 12 full months of data.
- Not measured at this location.

The number of days in 1985 on which the state 1-hour standard for carbon monoxide (1-hour CO > 20 ppm) was exceeded is also given in Appendix Table XII. The affected area was smaller than for the 8-hour standard, and exceedances were less frequent. The locations with the greatest number of days on which the standard was exceeded were Lynwood and Lennox (12 days). The highest 1-hour average CO concentration was recorded at Lynwood (33 ppm).

## Federal Standards

The number of days on which the federal 8-hour standard (8-hour CO>9.4 PPM) was exceeded is given in Appendix Table XII. Lennox, Lynwood and Burbank recorded exceedances of the federal 8-hour standard most frequently, with 45 days, 32 days and 15 days above the standard, respectively. The federal 1-hour standard (1-hour average CO > 35 ppm) was not exceeded.

## Stage I Episode (Federal Alert Level)

Appendix Table XII lists the number of days in 1985 on which the Stage I Episode level (8-hour average CO>15 ppm) was exceeded. All but one of the exceedances occurred in the densely populated portions of Los Angeles County. The episode level was exceeded most frequently at Lynwood (10 days).

## Seasonal and Diurnal Variation in Carbon Monoxide Concentrations

Carbon monoxide levels in the Basin tend to be highest in winter, and during late night and early morning hours. The seasonal and diurnal variations in CO are almost exactly the opposite of those for ozone.

Figure 7 shows the average CO concentration for each month at Lennox, which frequently has the highest CO in the Basin. The Lennox air monitoring station is located at a major intersection and is about 100 yards west of the heavily traveled San Diego Freeway. December average CO concentrations were about 3.6 times those of June.

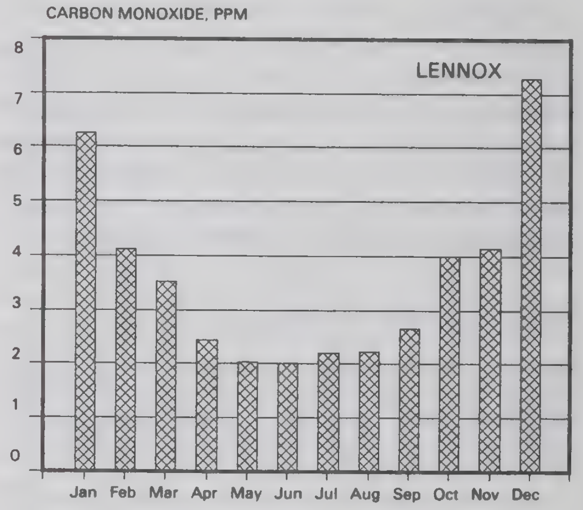



FIGURE 7. CARBON MONOXIDE - SEASONAL VARIATION MONTHLY AVERAGES, 1985

Figure 8 shows the diurnal variation in CO at Lennox. The peak CO concentration for the day typically occurs at the time of morning rush hour both summer and winter, with peak winter concentrations in 1985 averaging about twice as high as in summer. In winter, there is generally a secondary peak late at night. The seasonal difference in CO concentrations is due to the more frequent occurrence in winter of late night and early morning surface inversions, which limit vertical mixing of vehicular and other ground level emissions.

## Trends

Carbon monoxide trends for 1975-1984 were examined, based on 6-station composite averages. The stations used to form the average were: Burbank, Reseda, Lennox, Lynwood, West Los Angeles and Downtown Los Angeles. These six stations comprise the bulk of the CO problem in the Basin.

The 6-station mean of the daily maximum 1-hour CO concentration during the high CO season decreased steadily from 14.0 ppm in 1975 to 8.5 ppm in 1983, before increasing to 9 ppm in 1984. The increase in CO from 1983 to 1984 was due in large measure to a change to meteorological conditions more favorable for the buildup of CO concentrations.

The effect of meteorological bias on the calculation of "true" CO trends may be reduced by the use of 3-year running means. Adjusted to this format, the six-station mean of the daily maximum 1-hour average CO concentrations decreased steadily from 12.9 ppm in 1975-1977 to 8.9 ppm in 1982-1984, showing an overall decline of 31 percent between 1975-77 and 1982-84.

## Carbon Monoxide - Comparison of Basin to Other Areas in the United States

In Table X the number of days on which the federal standard for carbon monoxide was exceeded is shown for the ten largest urban areas in the U.S. The maximum 1-hour average concentrations are also given for each area. The New York urban area led by a substantial margin in the number of days exceeding the federal standard. The Los Angeles area was second. Los Angeles reported the highest 1985 annual maximum 1-hour average concentration, of the ten urban areas.

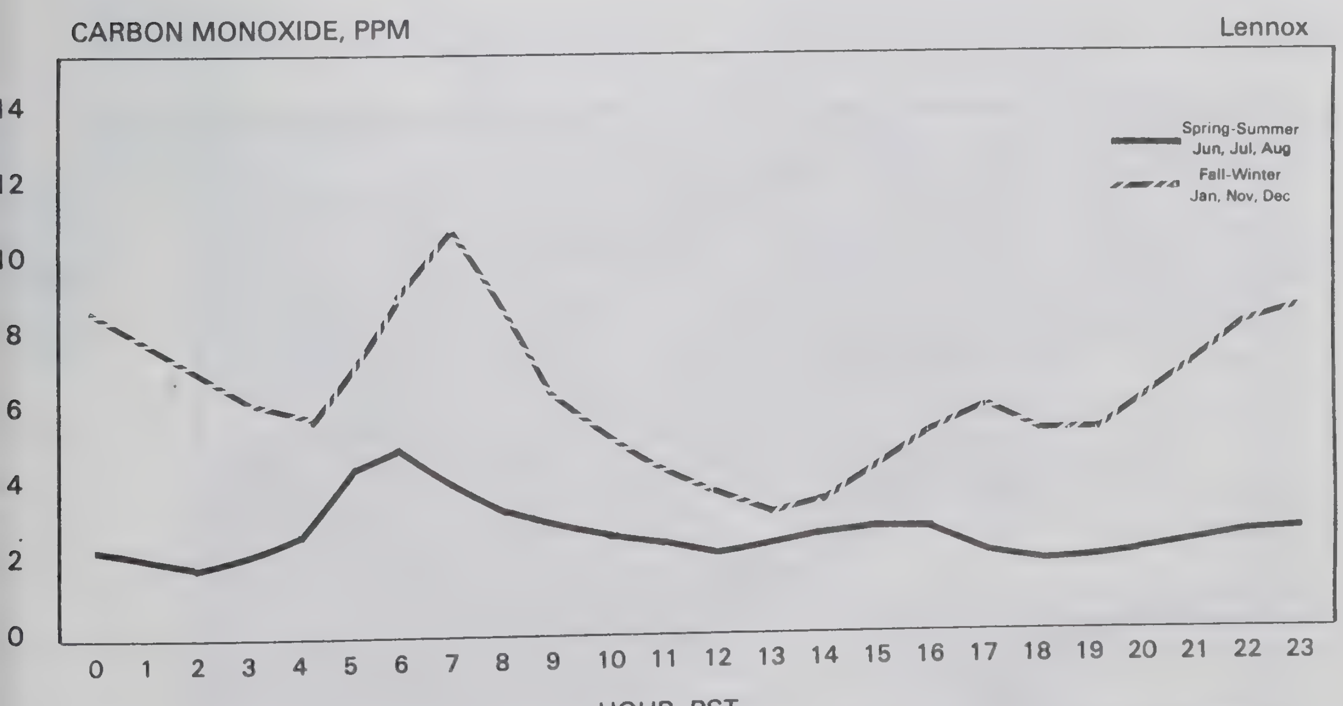



FIGURE 8. CARBON MONOXIDE - DIURNAL VARIATION. AVERAGE FOR EACH HOUR, 1985

Table XI shows the five U.S. counties, irrespective of population, which had the greatest number of exceedances of the federal standard and the five counties which had the highest 1985 maximum 1-hour concentrations of carbon monoxide. Los Angeles County is among the five worst in both categories.

## NITROGEN DIOXIDE

Nitrogen dioxide ($NO_2$) is a brownish gas with an odor somewhat like that of bleach. It is formed in the atmosphere primarily by the rapid reaction of the colorless gas nitric oxide (NO) with atmospheric oxygen. These two compounds are referred to collectively as oxides of nitrogen. The most recent emissions inventory showed that about 2/3 of the oxides of nitrogen were emitted by mobile sources, and the remaining 1/3 were emitted by stationary sources. The rapidity of the chemical reaction of NO to $NO_2$ results in the highest concentrations of nitrogen dioxide occurring relatively close to the areas where emissions of oxides of nitrogen are greatest. In addition to being a regulated pollutant itself, nitrogen dioxide is a participant in the chemical reactions which form ozone and other constituents of photochemical smog.

### 1985 Nitrogen Dioxide Air Quality

#### State Standard

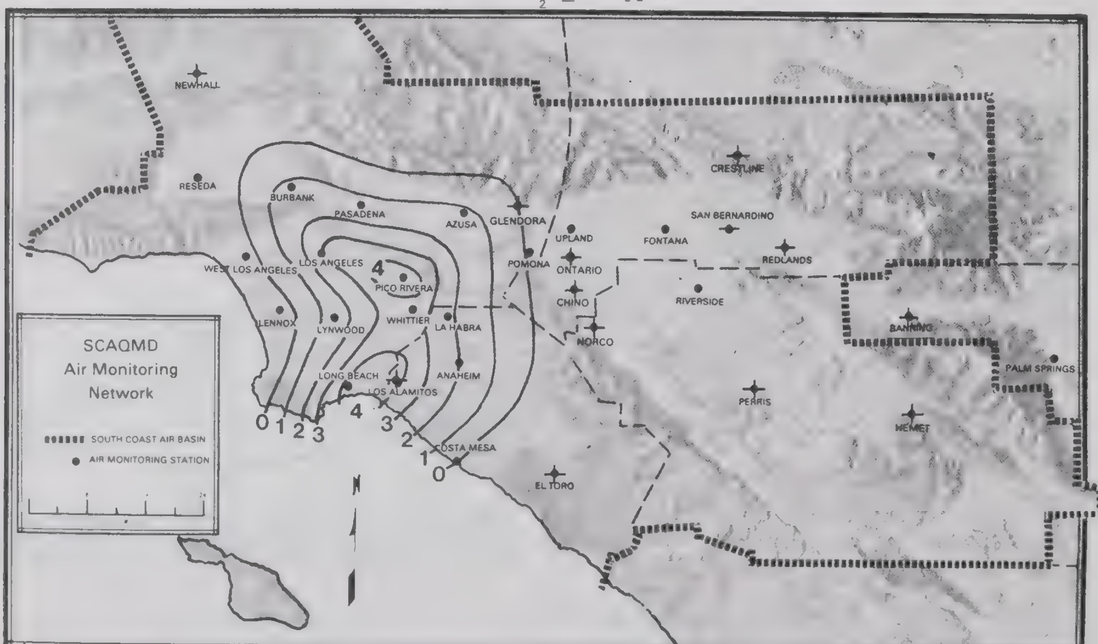
Figure 9 shows the number of days in 1985 on which the state standard for nitrogen dioxide (1-hour average $NO_2 \geqq .25$ ppm) was exceeded. The standard was exceeded in roughly one-fifth of the Basin, primarily in coastal and central Los Angeles County. The greatest number of exceedances occurred at Long Beach and Pico Rivera (4 days). The maximum 1-hour concentrations and exceedances are given for each station in Appendix Table XIII.

#### Federal Standards

The federal standard for nitrogen dioxide (annual average $NO_2 > 100$ ug/m$^3$ or .0534 ppm) was exceeded in only 2 percent of the Basin's area, and the highest annual average reported was 1.1 times the standard. The stations registering the highest annual average nitrogen dioxide were Los Angeles (.0599 ppm), Burbank

FIGURE 9
NITROGEN DIOXIDE - 1985

NUMBER OF DAYS ON WHICH STATE STANDARD WAS EXCEEDED
(1-HOUR AVERAGE $NO_2 \geq .25$ ppm)




Less than 12 full months of data.
Not measured at this location.

(.0571), and Pomona (.0541). The 1985 annual average nitrogen dioxide concentrations for all stations are shown in Appendix Table XIII.

## Stage I Episode (Federal Alert Level)

The number of days on which the Stage I Episode level for nitrogen dioxide (24-hour average $NO_2 \geq .15$ ppm) was exceeded, and the maximum 24-hour nitrogen dioxide concentrations for 1985, are given in Appendix Table XIII. About 15 percent of the Basin's area recorded exceedances of the alert level, and the maximum 24-hour average concentration was 1.5 times the alert level. The greatest number of days exceeding occurred at Long Beach (4).

## Seasonal and Diurnal Variation in Nitrogen Dioxide Concentrations

The seasonal and diurnal patterns in nitrogen dioxide concentrations are not as well defined as those for ozone and carbon monoxide and differ widely from location to location. The highest concentrations typically occur in the fall-winter months and the lowest in the spring or summer. The maximum hourly average of the day frequently occurs during late morning.

The monthly average nitrogen dioxide concentrations for 1985 at Long Beach are shown in Figure 10. The highest monthly average was reported for December and was 3.2 times the lowest monthly average, measured in May.

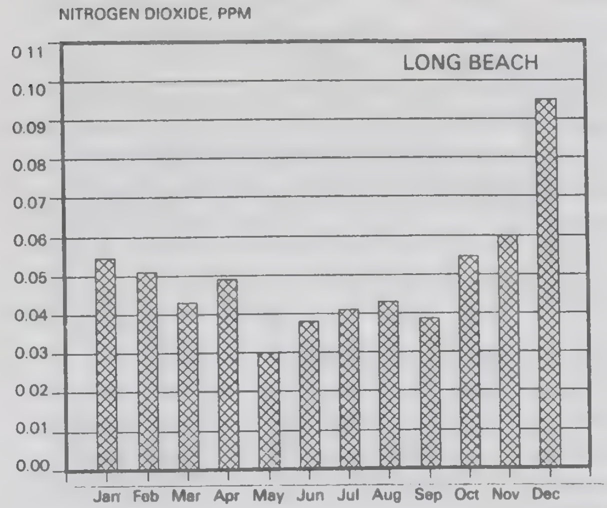



FIGURE 10. NITROGEN DIOXIDE-SEASONAL VARIATION MONTHLY AVERAGES, 1985

Figure 11 presents the average nitrogen dioxide concentrations at Long Beach for each hour for the spring-summer (May-July) and fall-winter (January, November, December) months of 1985. The peak hour during fall-winter at this location is 9 a.m., and a secondary peak is reached at 5 p.m. During spring-summer, average concentrations are low for all hours. The diurnal pattern varies with location. At some

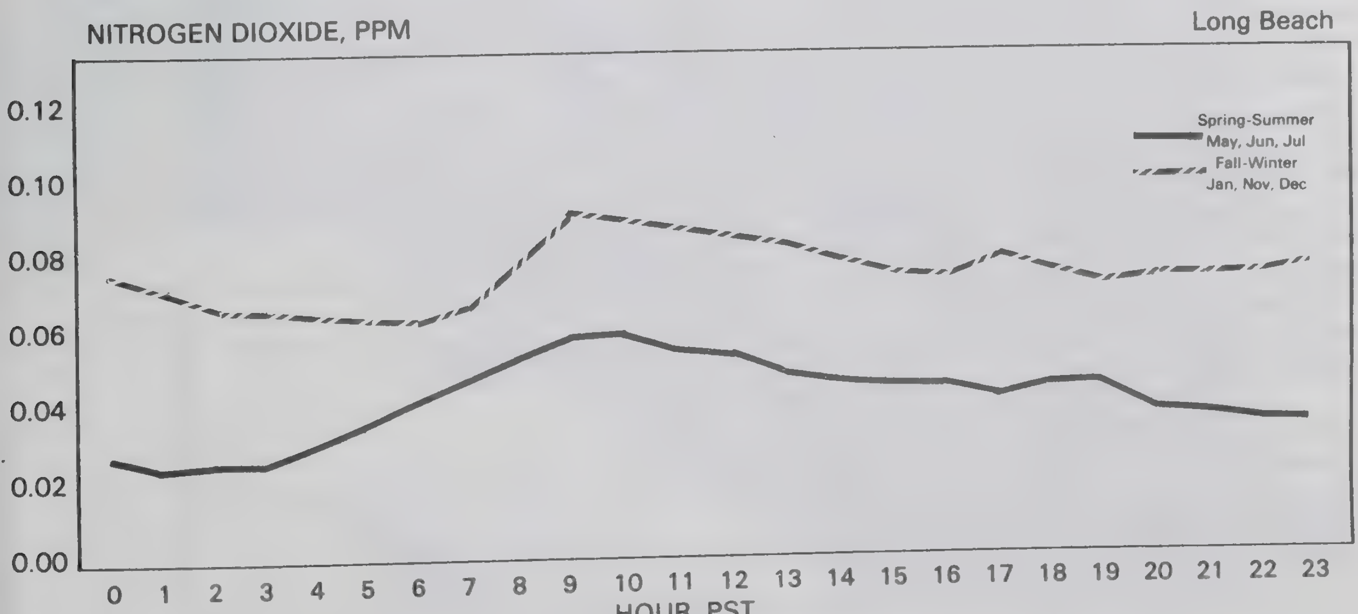



FIGURE 11. NITROGEN DIOXIDE - DIURNAL VARIATION. AVERAGE FOR EACH HOUR, 1985

coastal locations, a late morning peak is observed but the secondary evening peak is lacking. At inland locations the evening peak may be higher than the late morning peak. The lack of well-defined seasonal and diurnal patterns in concentrations makes it difficult to state generally when concentrations will be highest.

## Trends

Trends in $NO_2$ based on a composite average of six key stations (Burbank, Long Beach, Lennox, West Los Angeles, Downtown Los Angeles and Pasadena) were examined. The 6-station mean annual $NO_2$ concentration during 1984 was the lowest of any year during the period 1975-1984. The 3-year running mean showed a downtrend from 1976-1978 to 1982-1984 with an overall decline of 19 percent in $NO_2$ concentrations from 1975-1977 to 1982-1984.

## Nitrogen Dioxide - Comparison of Basin to Other Areas in the United States

Nitrogen dioxide air quality in the ten largest U.S urban areas is compared in Table X. In 1985, the Los Angeles urban area had both the highest annual average and the highest peak concentration of the ten urban areas.

The five counties with the highest annual average and the five counties with the highest 1985 peak concentrations (annual maximum 1-hour average) of nitrogen dioxide in the U.S. are shown in Table XI. Los Angeles County had the highest 1985 annual average nitrogen dioxide concentrations in the U.S. The highest and second highest 1985 annual maximum 1-hour average concentrations were recorded in other areas of the U.S. (Nassau County, New York and Clark County, Nevada). Los Angeles and Orange counties tied for third and fourth highest, respectively.

Although Los Angeles County was the only county in the U.S. to exceed the federal standard for nitrogen dioxide, the standard was exceeded by only a narrow margin and at only a few locations.

## SULFUR DIOXIDE

Sulfur dioxide ($SO_2$) is a colorless gas with a sharp, irritating odor. It is emitted directly into the atmosphere, primarily by stationary sources such as power plants, petroleum refineries, and chemical plants. Sulfur dioxide can react in the atmosphere to give sulfuric acid and sulfates, which can contribute to acid deposition and visibility reduction.

### 1985 Sulfur Dioxide Air Quality

#### State Standard

Figure 12 shows the maximum 1-hour average sulfur dioxide concentrations for 1985. The state standard (1-hour average $SO_2 \geq .25$ ppm) was not exceeded anywhere. The maximum 1-hour average concentration, .08 ppm reported at Long Beach, was about one-third of the standard. The 1985 maximum 1-hour and 24-hour average sulfur dioxide concentrations are given in Appendix Table XIV. The state 24-hour standard was not exceeded.

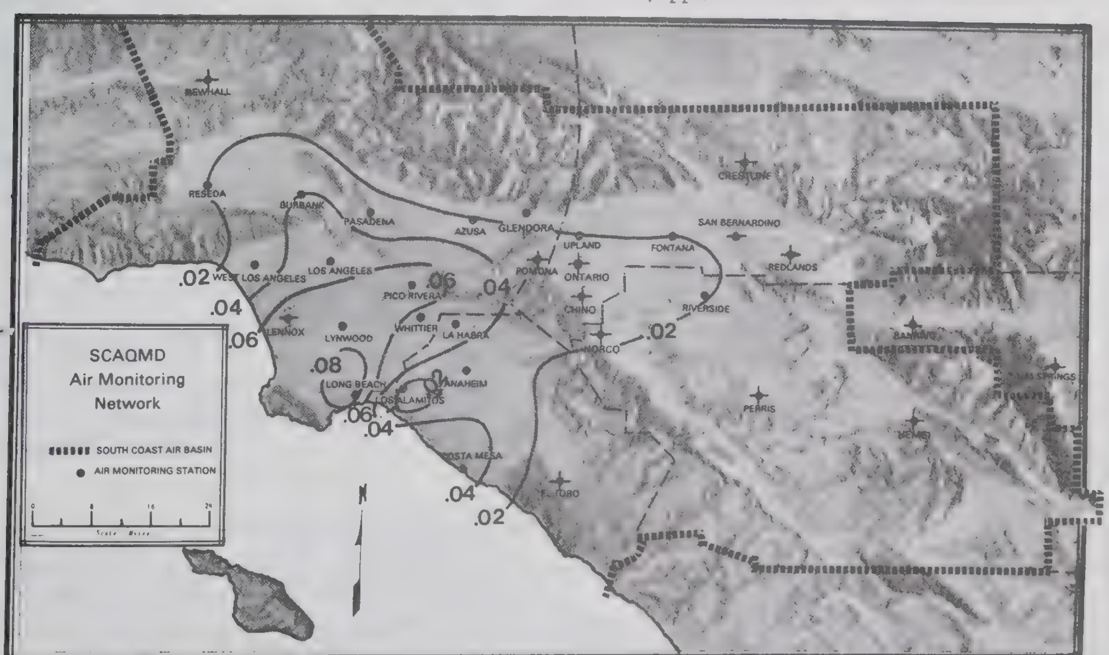
#### Federal Standards

The less stringent federal 1-hour, 24-hour and annual average standards were not exceeded at any location. The maximum 1-hour, 24-hour and annual average sulfur dioxide concentrations were substantially below these standards. Annual average sulfur dioxide concentrations for 1985 at all stations are given in Appendix Table XIV.

### Seasonal and Diurnal Variation in Sulfur Dioxide Concentrations

Unlike many other areas of the United States, this Basin has low $SO_2$ concentrations during every month of the year. The diurnal variation is complex, but at most locations, daytime concentrations are higher than those at night.

FIGURE 12
SULFUR DIOXIDE - 1985
MAXIMUM 1-HOUR AVERAGE, ppm*




Less than 12 full months of data.
Not measured at this location.
*State standard = 1-hour average $SO_2 \geq .25$ ppm. The state standard was not exceeded at any location.

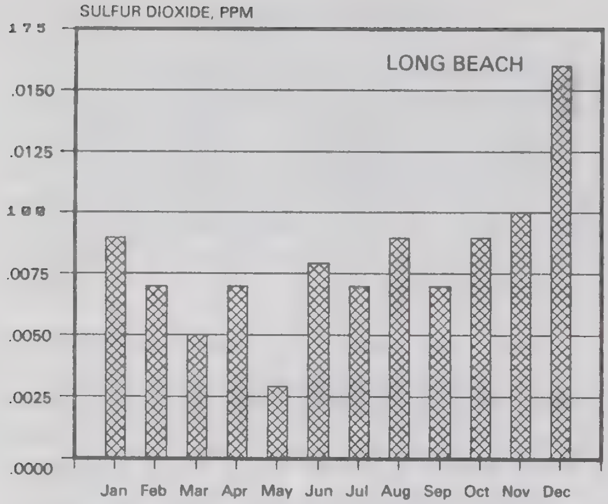



FIGURE 13. SULFUR DIOXIDE - SEASONAL VARIATION MONTHLY AVERAGES, 1985

The monthly average sulfur dioxide concentrations at Long Beach, which reported the highest 1-hour average concentration of 1985, are shown in Figure 13. The highest monthly averages were in the late fall and winter, with the monthly average for the highest month (December) 5.7 times that for the lowest (May).

Figure 14 shows the diurnal variation in sulfur dioxide concentrations in spring (March-May) and winter-fall (January, November and December) of 1985 at Long Beach. The peak hour for fall-winter is 8 a.m. Both seasonal and diurnal patterns can differ substantially at different locations, but concentrations at all locations are below even the most stringent standards.

## Trends

The Basin has been in attainment with the federal $SO_2$ standards since the mid 1960's. With the exception of one single violation on one day in 1984, the Basin has also been in attainment with the state standards since 1977. Analysis of the single exceedance in 1984 showed that it was associated with operational problems at a major refinery.

## Sulfur Dioxide - Comparison of Basin to Other Areas in the United States

Of the ten largest U.S. urban areas, Los Angeles had the lowest sulfur dioxide concentrations of all but San Francisco. Chicago reported the highest 1-hour average sulfur dioxide concentration in 1985 (Table X). The highest annual average sulfur dioxide concentration was measured in the New York urban area. The Los Angeles area, although second in population, had a lower annual average concentration than six of the other nine areas.

Of the five U.S. counties with the greatest number of days exceeding the federal standard

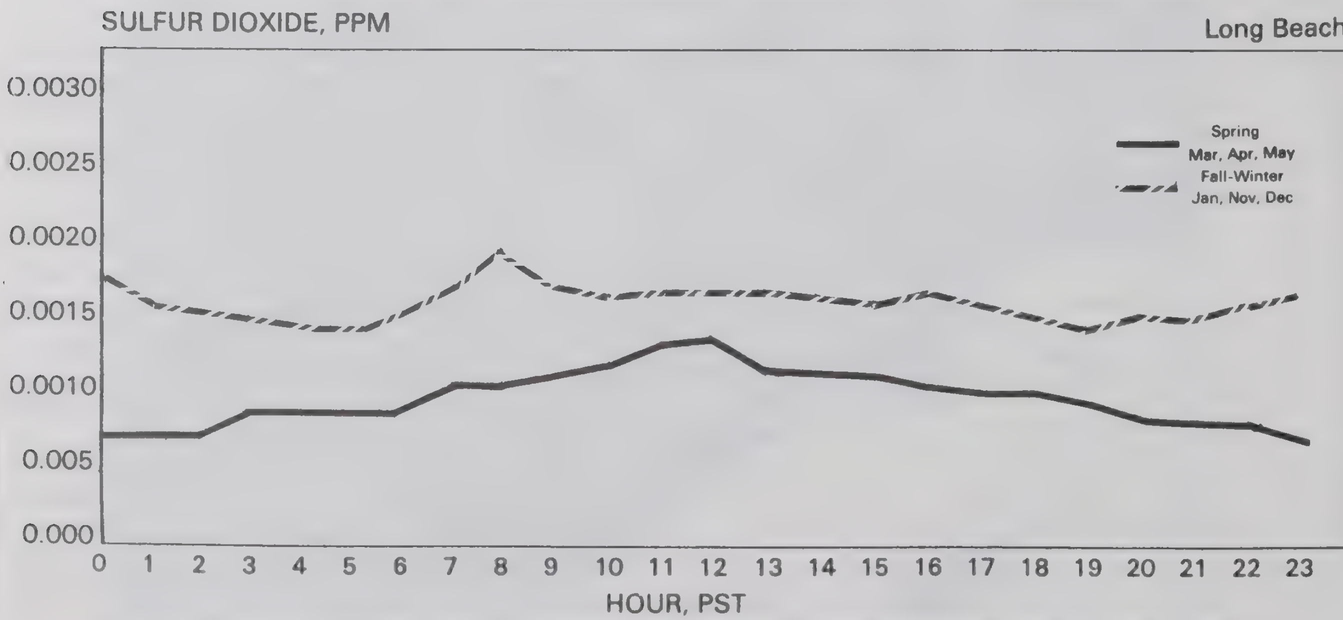



FIGURE 14. SULFUR DIOXIDE - DIURNAL VARIATION. AVERAGE FOR EACH HOUR, 1985

for sulfur dioxide, none are in the South Coast Air Basin, nor are any of the five counties with the highest 1-hour average concentrations of the year. (Table XI)

## TOTAL SUSPENDED PARTICULATE (TSP)

Total suspended particulate (TSP) is the name given to the solid matter suspended in the atmosphere. This complicated mixture of natural and man-made materials includes soil particles, biological materials, sulfates, nitrates, organic (or carbon-containing) compounds, and lead.

Constituents of this pollutant are responsible for nearly all of the pollution-induced visibility reduction in the Basin. As with ozone, TSP is highest well downwind of the most densely populated areas due to the fact that gaseous contaminant emissions react to yield particulate contaminants (e.g., sulfates, nitrates and organic compounds) several hours later when the air mass is usually well downwind of the sources. In addition, there is likely to be a larger natural contribution to the TSP in the less urbanized areas of the Basin, due to the greater amounts of exposed soil which can be entrained into the ambient air by surface winds.

A high volume sampler is used to determine TSP concentration by passing a measured volume of air through a glass fiber filter for a 24-hour period. The filter is weighed to determine the concentration of TSP, after which it is analyzed for lead, sulfate, and nitrate. TSP samples are normally collected every sixth day.

In 1985, nitrates averaged from 11 to 20 percent, sulfates from 5 to 12 percent, and lead from 0.1 to 0.4 percent of the total weight of TSP collected, depending on the particular location in the Basin. TSP is routinely analyzed only for these three components. Air quality standards exist for lead and sulfates.

Limited studies at a few Basin locations suggest that soil and organic compounds constitute a significant fraction of TSP. During 1979-1980 the Environmental Protection Agency collected particulate samples in the Basin and analyzed them for silicon, a major constituent of soils. TSP samples collected between 1979 and 1981 at Basin locations by the California Air Resources Board (ARB) were analyzed for benzene-soluble organics. These data were used to estimate the organic (carbonaceous) fraction of TSP.

The size of particles suspended in the atmosphere varies widely, ranging from less than 0.01 microns (one micron is one-millionth of a meter) to up to 100 microns in diameter. The fine particles (less than 2.5 microns in diameter) tend to remain suspended in the atmosphere longer, have a greater effect on visibility and, because of their greater tendency to penetrate deeply into the lungs, are more of a health hazard. In 1979, a nationwide inhalable particulate network was established by the federal government, using instruments which divide particulate into coarse (greater than 2.5 microns) and fine (less than 2.5 microns) fractions. EPA analyses of fine and coarse particulate from this Basin showed soil particles (silicon) were mainly in the coarse fraction, while sulfate was concentrated mainly in the fine fraction.

## 1985 TSP Air Quality

### Federal Standard

Figure 15 shows the annual average total suspended particulate concentrations. Approximately 2/5 of the Basin exceeded the annual average federal primary standard and about 2/3 of the Basin exceeded the annual federal secondary standard (annual average TSP >75 ug/m$^3$ and > 60 ug/m$^3$,* respectively). The highest annual average total suspended particulate was recorded at Riverside-Rubidoux (132 ug/m$^3$). The annual averages at each of the District's monitoring locations are given in Appendix Table XV.

The number of days in 1985 on which the 24-hour federal primary standard level and secondary standard level (24-hour average TSP> 260 ug/m$^3$ and 24-hour average TSP >150 ug/m$^3$, respectively) were exceeded and the maximum 24-hour average recorded at each station are given in Appendix Table XV.

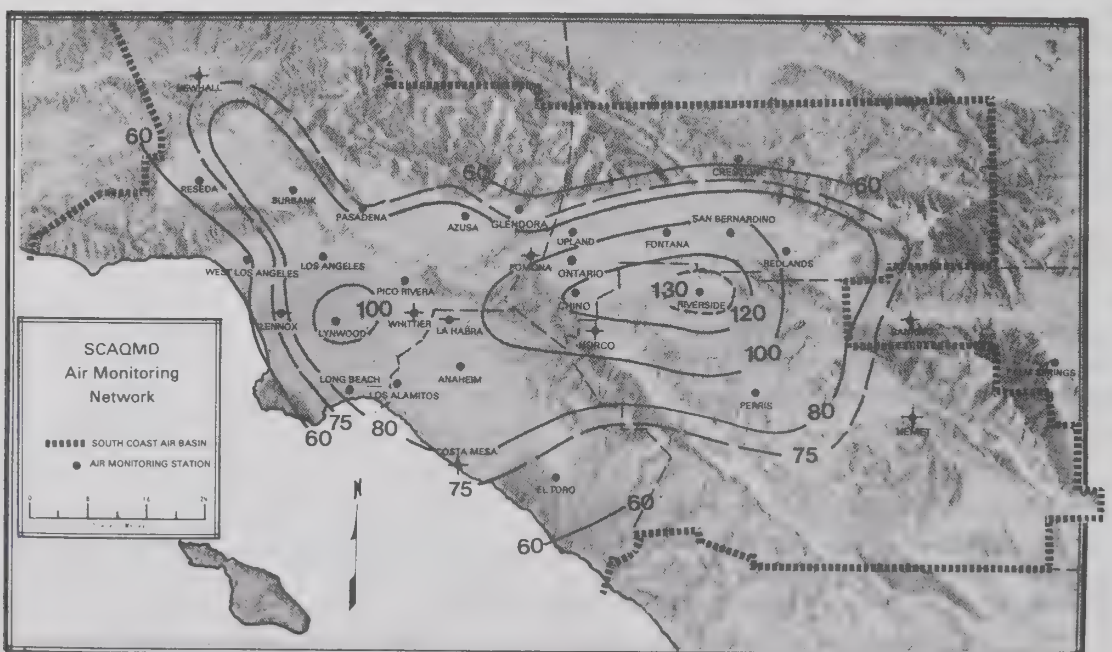
Eight Basin stations recorded exceedances of the federal primary 24-hour standard in 1985. Riverside-Rubidoux exceeded most frequently (7% of days sampled). All of the regular air monitoring stations except Crestline recorded exceedances of the federal secondary standard.

### Stage I Episode

In 1985, the Stage 1 Episode level (375 ug/m$^3$) was exceeded at one Basin location on one day (Reseda, 392 ug/m$^3$), and at two locations in the neighboring Southeast Desert Air Basin (Indio, 606 ug/m$^3$ and Trona 393 ug/m$^3$).

*Total suspended particulate is reported in units of micrograms per cubic meter (ug/m$^3$). One ug/m$^3$ is approximately equal to one billionth of an ounce per cubic foot.

FIGURE 15
TOTAL SUSPENDED PARTICULATE - 1985
ANNUAL GEOMETRIC MEAN, $\mu g/m^3$




✦ Not measured at this location.
✦ Less than 12 full months of data.
- - - - Intervals of 10.
——— Intervals of 20.
— — Federal primary standard = 75 $\mu g/m^3$ TSP, annual geometric mean.

## Seasonal and Diurnal Variation in TSP

The seasonal variation of total suspended particulate is not as pronounced as that of ozone or carbon monoxide and varies with location. Since a substantial fraction of total suspended particulate is, like ozone, formed in the atmosphere by chemical reactions of gaseous precursors, the peak concentrations occur downwind of the areas of heaviest precursor emissions.

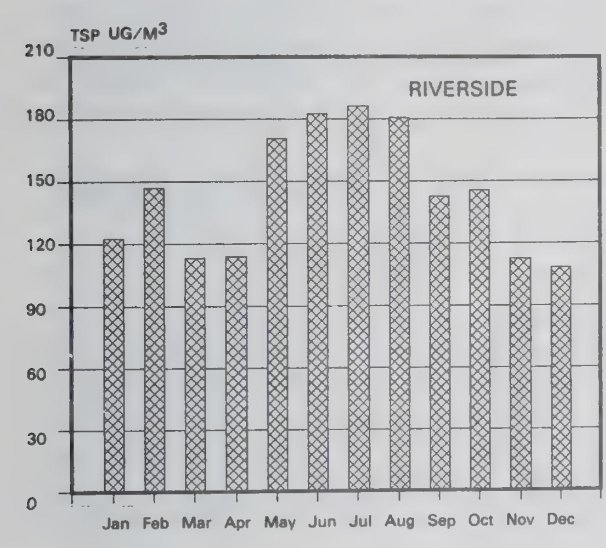



FIGURE 16. TSP - SEASONAL VARIATION MONTHLY AVERAGES, 1983-85

Figure 16 shows the 1983-1985 monthly average TSP at Riverside. Concentrations are highest in summer and lowest in winter and spring. The monthly average for July is 1.7 times that for December. This is typical in the high TSP area, but not in coastal and central Los Angeles and Orange counties, where highest monthly average concentrations frequently occur in winter.

Since particulate is normally collected for a full 24 hours before weighing or analysis, diurnal variations are not normally observed. Special studies were done by Witz et al. of the District laboratory in July-September 1977, in which two-hour TSP samples were collected at downtown Los Angeles. Analyses for sulfate and nitrate were also done. These will be discussed later in the sections dealing with those pollutants.

Figure 17 shows the diurnal variation in TSP found at downtown Los Angeles in summer

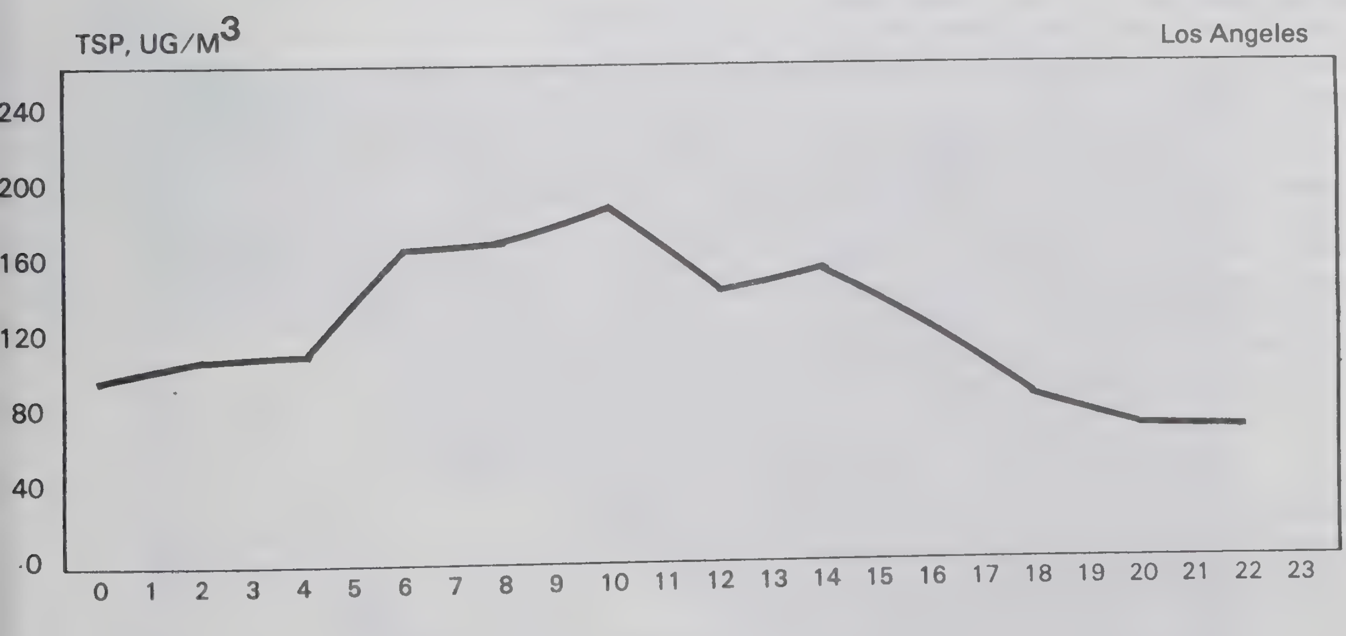



FIGURE 17. TOTAL SUSPENDED PARTICULATE - DIURNAL VARIATION.

TWO-HOUR AVERAGES, JULY-AUGUST 1977

1977 by Witz, et al. Marked diurnal differences were found, with concentrations generally higher in the daytime than at night, and the highest average for a two-hour period occurred from 9:00 a.m. to 11:00 a.m. PST. For the 24 sampling days studied during July-September 1977, the highest two-hour average particulate levels occurred between 5:00 a.m. and 5:00 p.m. on all days, and on 50 percent of the days the maximum occurred in the period 9:00 a.m.-11:00 a.m., PST.

## Trends

Trends in total suspended particulate for the period 1975-1984 based on an 8-station composite average were examined. The key stations chosen to form the composite average were: Azusa, Pasadena, Lynwood, Downtown Los Angeles, La Habra, Riverside, San Bernardino and Fontana. The 8-station average TSP increased 20 percent from 1983 to 1984. This increase from 1983 to 1984 was primarily due to the extremely good ventilation of the period March through April of 1983. Use of 3-year running means tends to lessen the effect of meteorology on air quality trends. On this basis, from 1975-1977 to 1982-1984 there has been an overall reduction of 7 percent in TSP concentrations. Clearly, as far as improvements in air quality over the period 1975-1984 are concerned, TSP is lagging well behind most other criteria pollutants.

## Total Suspended Particulate - Comparison of Basin to Other Areas in the United States

In 1985, the Los Angeles urban area had the highest annual average total suspended particulate of the ten largest urban areas in the U.S. Four other urban areas had higher maximum 24-hour average concentrations in 1985. (Table X).

No South Coast Air Basin county is included in a listing of the five U.S. counties recording the greatest number of days exceeding the federal 24-hour standard for TSP or the maximum 24-hour average TSP concentrations (Table XI).

## SUSPENDED PARTICULATE (PM10)

In August 1983 the Air Resources Board replaced the state standard for total suspended particulate (TSP) with a standard for PM10. The newer standard considers only the finer sized particulate, that collected by an instrument with an upper size cutpoint of 10 microns, referred to as PM10. The present standards require that suspended particulate matter (PM10) not exceed 50 ug/m$^3$, 24-hour average or 30 ug/m$^3$ annual average. The PM10 standards are set at exactly half of the TSP standards which they replaced.

### 1985 PM10 Air Quality

#### State Standard

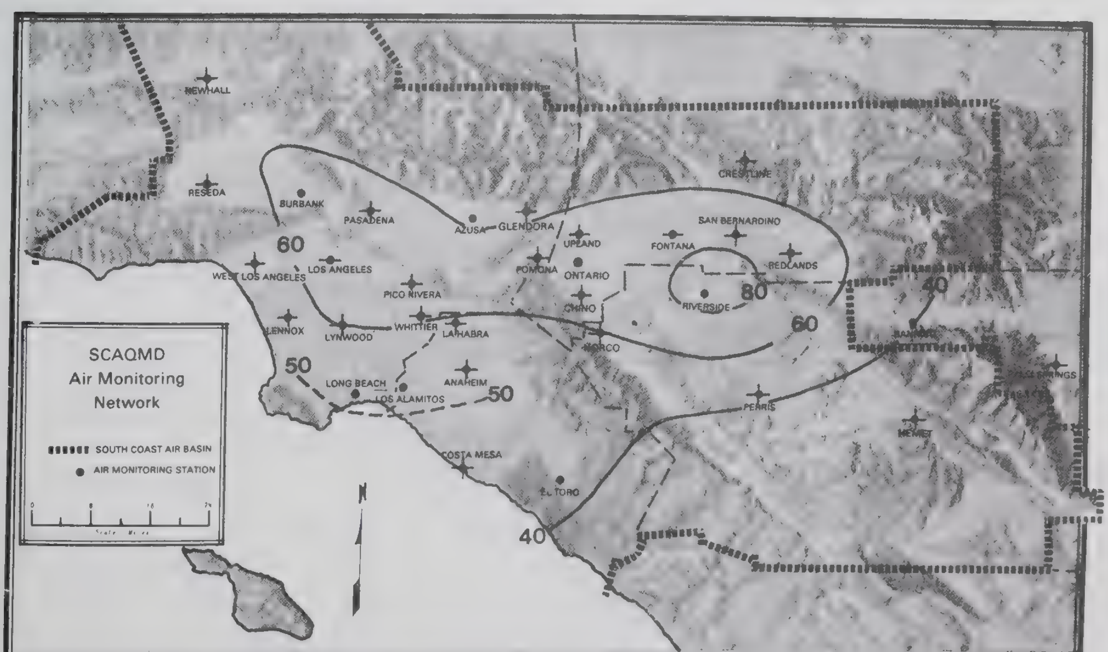
Figure 18 shows the annual average suspended particulate (PM10) levels in the Basin. All locations had annual average concentrations in excess of the state standard (annual geometric mean PM10 $\geq$ 30 ug/m$^3$). The pattern observed is similar to that obtained for TSP. The location with the highest annual average concentration is again Riverside-Rubidoux (81 ug/m$^3$).

The state 24-hour PM10 standard was also exceeded throughout the Basin. Burbank exceeded the standard most frequently 77% of days sampled) followed by Riverside (75%). The maximum 24-hour average PM10 level in the Basin in 1985 was measured at Riverside-Rubidoux (208 ug/m$^3$). This was exceeded in the neighboring SEDAB, at Indio (358 ug/m$^3$) during exceptionally windy conditions. The number of days exceeding the state 24-hour standard, and the annual maxima and averages for each location monitoring PM10 are given in Appendix Table XVI.

#### Proposed Federal Standards

The EPA has proposed a range of values for a federal standard for PM10. The proposed range for the federal primary annual average standard is 50-65 ug/m$^3$ (annual arithmetic mean PM10). From 3 to 5 of the 11 Basin locations monitoring PM10 in 1985 would exceed the annual federal primary standard, depending on the level selected.

FIGURE 18
SUSPENDED PARTICULATE (PM10)-1985
ANNUAL GEOMETRIC MEAN, $\mu g/m^3$




- Less than 12 full months of data.
- Not measured at this location.
- – – Intervals of ten.
- —— Intervals of twenty.

The range for a federal 24-hour primary PM10 standard has been proposed at 150-250 ug/m$^3$. From 0 to 5 of the 11 locations monitoring PM10 in 1985 would have recorded exceedances, depending upon the level selected. (See Appendix Table XVI).

## Seasonal Variation in PM10

The seasonal variation in PM10 is similar to that observed for TSP as can be seen in figure 19. The total height of each bar indicates the monthly average TSP concentration in ug/m$^3$.

The height of the crosshatched portion of the bar indicates the PM10 concentrations in ug/m$^3$. The 1985 PM10 concentrations at Riverside averaged 64% of TSP concentrations, with monthly percentages ranging from 51%-74%. Both PM10 and TSP were lowest in January. The two highest months for both were July and August, but TSP was highest in August, while PM10 was highest in July. (See Figure 19)

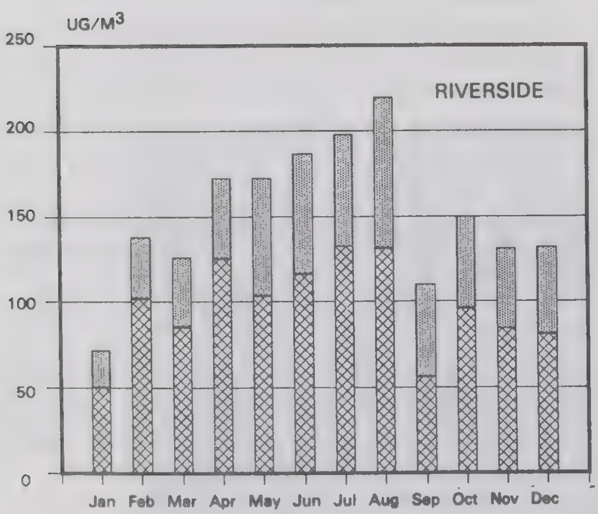



FIGURE 19. RIVERSIDE - PROPORTION OF PM10 IN TSP BY MONTH, 1985

As is the case with TSP, the pattern of seasonal variation in PM10 concentration depends on location. While Riverside showed a spring-summer peak in both PM10 and TSP, this is not the pattern at Long Beach. Concentrations were highest in April and both PM10 and TSP are higher in January than in July and August. PM10 concentrations averaged 62% of TSP at Long Beach, with monthly averages ranging from 53-74% of corresponding monthly averages for TSP. (Figure 20)

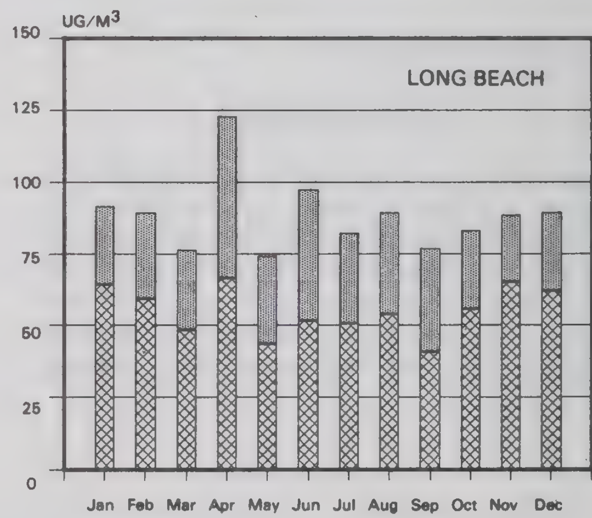



FIGURE 20. LONG BEACH - PROPORTION OF PM10 IN TSP BY MONTH, 1985

## LEAD

Combustion of leaded gasoline accounts for nearly all of the lead emitted into the atmosphere of the South Coast Air Basin. As a consequence, lead concentrations are highest in the densely populated parts of Los Angeles and Orange counties where vehicular traffic is heaviest. The reduction of gasoline lead content has resulted in a sharp decrease in atmospheric lead concentrations over the last decade. Atmospheric lead, which is a mixture of a number of chemical compounds of lead, is a small percentage of the material collected as total suspended particulate (0.1 to 0.4 percent in 1985). It is concentrated primarily in the fine particle fraction of TSP.

### 1985 Lead Air Quality

#### State Standard

In 1985, the state standard for lead, (monthly average lead $\geq$1.5 ug/m$^3$) was met throughout the Basin. Figure 21 shows the maximum monthly average lead concentrations. The highest monthly average lead concentration was reported at Lynwood (.91 ug/m$^3$), followed by Lennox (.90). Maximum monthly averages for all stations are given in Appendix Table XVII.

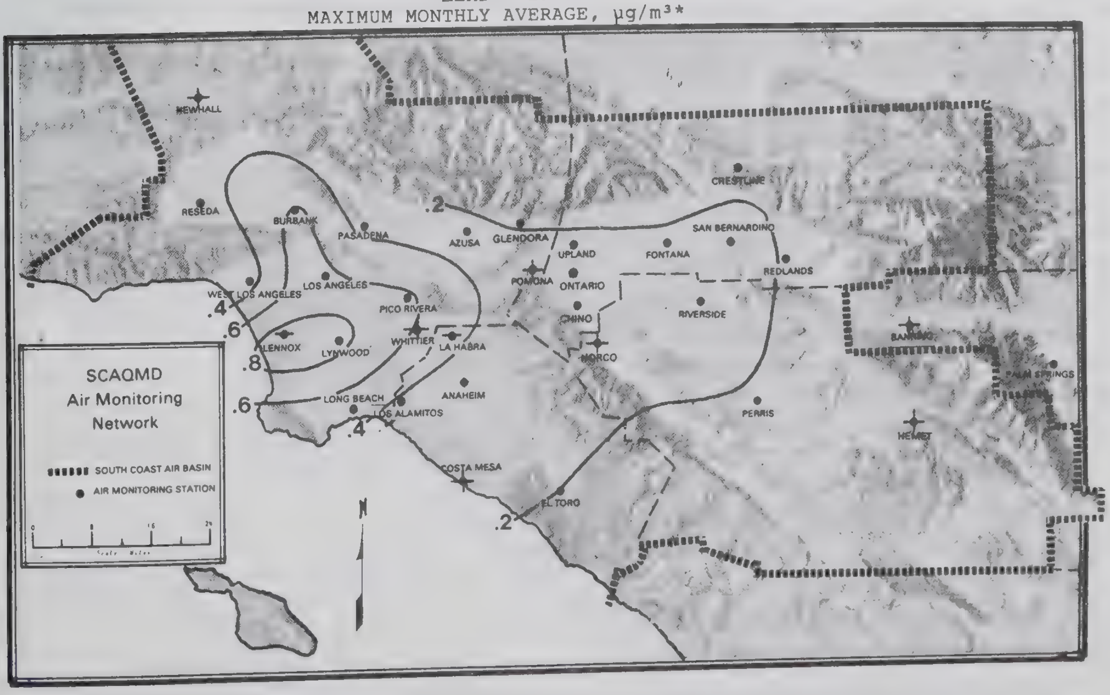
#### Federal Standard

The federal standard for lead (quarterly average lead >1.5 ug/m$^3$) was also met throughout the Basin in 1985. The stations with the highest quarterly average lead concentrations were Lynwood (.63 ug/m$^3$), and Lennox (.60).

### Seasonal and Diurnal Variation in Lead

Lead concentrations are typically highest in late fall and winter and lowest in spring and summer. In the study of diurnal variation in particulate by Witz et al., lead concentrations were not determined. However, since lead and carbon monoxide are alike in that both are emitted almost entirely by motor vehicles, it is possible to imply diurnal variations in lead from diurnal CO patterns. The surface inversions and light winds which result in high CO concentrations will also yield relatively high lead concentrations.

FIGURE 21
LEAD - 1985
MAXIMUM MONTHLY AVERAGE, $\mu g/m^3$*




✦ Less than 12 full months of data.
✦ Not measured at this location.
*State standard=monthly average lead $\geq$1.5 ug/m³. The standard was not exceeded at any location.

Figure 22 shows the 1983-1985 monthly average lead concentrations at Lennox. The monthly average lead concentration for January was 5.5 times that for June.

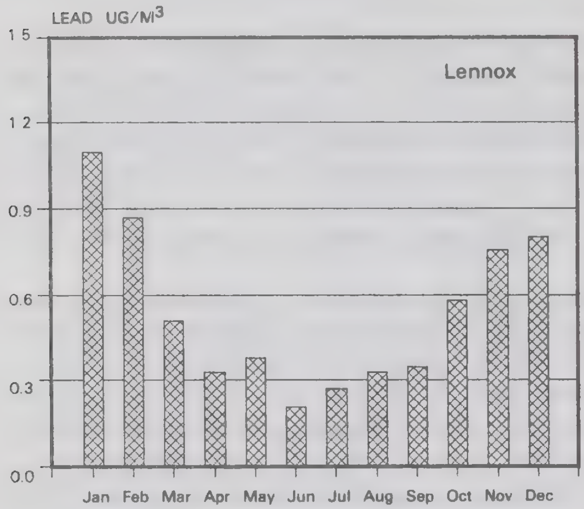



FIGURE 22. LEAD - SEASONAL VARIATION
MONTHLY AVERAGES, 1983-85

### Trends

The principal source of atmospheric lead has been leaded gasolines. As the average lead content in gasoline has been reduced, atmospheric lead concentrations in the Basin have shown dramatic improvement. In the mid-1970's almost all stations in the Basin exceeded the federal lead standard (1.5 micrograms per cubic meter, calendar quarter average). By 1982 only the Lennox station still exceeded the federal lead standard, and in 1983, for the first time, all Basin stations met the standard. The more stringent state lead standard (1.5 micrograms per cubic meter, monthly average) was also met at all stations for the first time in 1983. During 1984 and 1985 all Basin stations continued to meet both the federal and state air quality standards for lead.

### Lead - Comparison of Basin to Other Areas in the United States

Of the ten largest U.S. urban areas, only Philadelphia exceeded the federal lead standard in 1985. Los Angeles ranked fourth in annual maximum quarterly average lead concentrations. (Table X).

Although some other areas of the country did exceed the federal lead standard in 1985, no area in the South Coast Air Basin recorded any exceedance. (Table XI).

## SULFATES

Sulfates ($SO_4^{=}$) are a group of chemical compounds containing the sulfate group, a sulfur atom with four oxygen atoms attached. Most of the sulfate in the Basin's atmosphere is produced by oxidation of $SO_2$, a process favored by high relative humidity, photochemical activity, and limited vertical mixing. Oxidation of $SO_2$ gives $SO_3$, and $SO_3$ in the presence of water gives $H_2SO_4$ (sulfuric acid), which will react rapidly with basic materials to give sulfates. The sulfate particles formed are of a size range which efficiently scatters light, and consequently high sulfate concentrations result in considerable visibility degradation. Because some of the sulfate in the atmosphere is present as sulfuric acid, it can result in acid deposition. In 1985, sulfates accounted for 5 to 12 percent of the total suspended particulate sampled in the Basin, depending on the location.

## 1985 Sulfate Air Quality

### State Standard

Figure 23 shows the percent of days in 1985 on which the state standard for sulfate (24-hour average $SO_4^{=} \geq 25$ ug/m$^3$) was exceeded. The state standard was exceeded in about one-fiftieth of the Basin's area. The highest 24-hour average sulfate concentration in the Basin was measured at Long Beach (31 ug/m$^3$). The percent of days on which the state standard was exceeded and the maximum 24-hour average for 1985 are given for each station in Appendix Table XVIII.

### Federal Standards

There is no federal standard for sulfate.

### Seasonal and Diurnal Variation in Sulfate Concentrations

Although high sulfate concentrations occur throughout the year, the highest average concentrations occur in the summer and fall, while the lowest average sulfate concentrations occur in the winter and early spring. The summer-fall increase in average sulfate concentration occurs because this period registers many days of high relative humidity, strong photochemical activity and limited vertical mixing, all of which favor the conversion of $SO_2$ emissions to sulfate. Sulfate concentrations do not show sharp diurnal variation, but peak at different times depending on location. The closer to major $SO_2$ sources, the earlier in the day the sulfate peak appears.

Figure 24 shows the monthly average sulfate

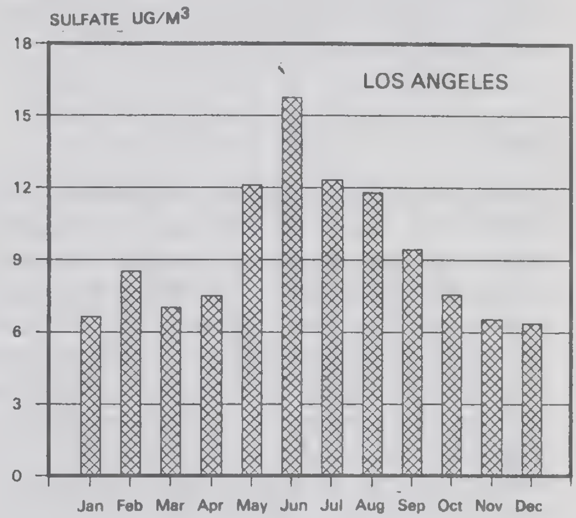
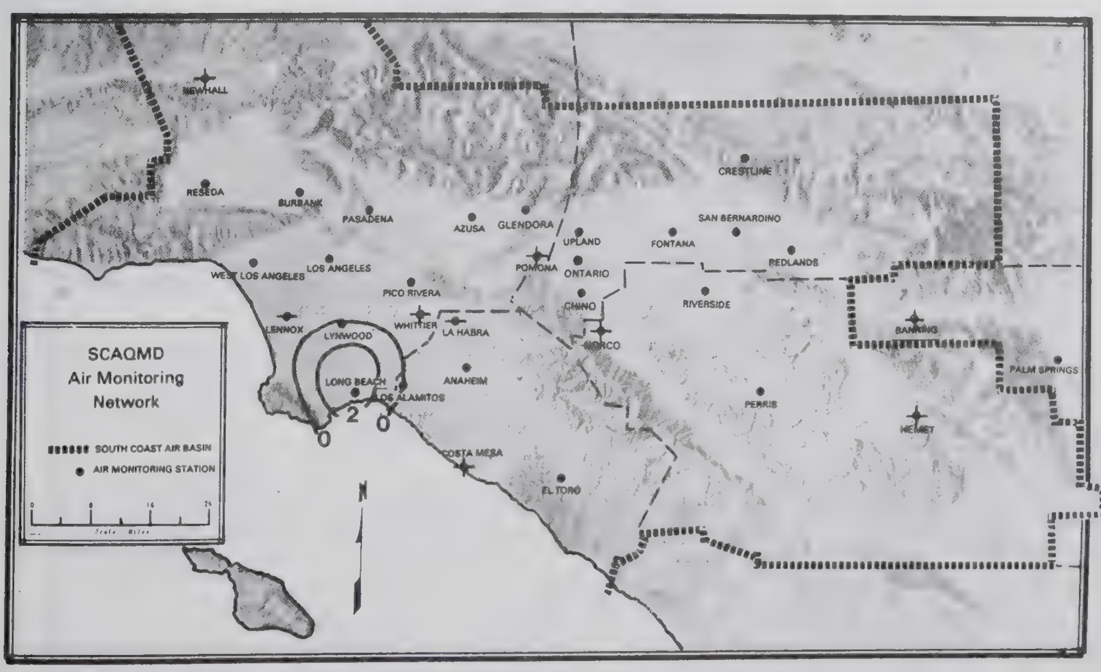



FIGURE 24. SULFATE - SEASONAL VARIATION
MONTHLY AVERAGES, 1983-85

FIGURE 23
SULFATE-1985
PERCENT OF DAYS ON WHICH STATE STANDARD WAS EXCEEDED
(24-HOUR AVERAGE SULFATE $\geq$ 25 $\mu$g/m$^3$)




- Less than 12 full months of data.
- Not measured at this location.

concentrations for 1983-1985 at Los Angeles. The ratio of June to December monthly averages was 2.6.

Figure 25 shows the average diurnal sulfate variation observed by Witz et al. in summer 1977 at downtown Los Angeles. The highest 2-hour sulfate was observed from 5 to 7 a.m. PST. The concentrations of sulfate did not vary diurnally as sharply as did those for TSP.

### Trends

Sulfate trends were determined for the period 1976-1984, based on a 9-station composite average (Azusa, Pasadena, Lennox, Lynwood, Downtown Los Angeles, La Habra, Riverside, San Bernardino and Fontana). The 9-station average sulfate concentration increased from 1976 to 1977, showed a steady decline from 1977 to 1982, increased again in 1983, and then resumed its decrease in 1984. The 3-year moving average of this statistic shows that, from 1976-1978 to 1982-1984, there was an overall decrease of 9 percent in sulfate concentrations.

## NITRATES

Nitrates ($NO_3^-$) are a family of chemical compounds containing the nitrate group, a nitrogen atom with three oxygen atoms attached. Nitrates in the atmosphere are produced by chemical reaction of the gaseous oxides of nitrogen. Some of the nitrate in the atmosphere is present as nitric acid which can cause acid deposition. Solid compounds such as ammonium nitrate and sodium nitrate are formed, contributing to visibility reduction in the Basin. In 1985, nitrates made up an average of 11 to 20 percent of TSP, depending on the location.

### 1985 Nitrate Concentrations

At present, no air quality standards for nitrate have been set by the state or federal governments. The data on nitrate air quality are therefore presented in terms of actual concentrations rather than the number of days on which a standard was exceeded. Figure 26 shows that in 1985, the highest average nitrate concentrations were centered in the San Bernardino-Riverside area. The highest annual average nitrate concentration was 23.1 ug/m$^3$

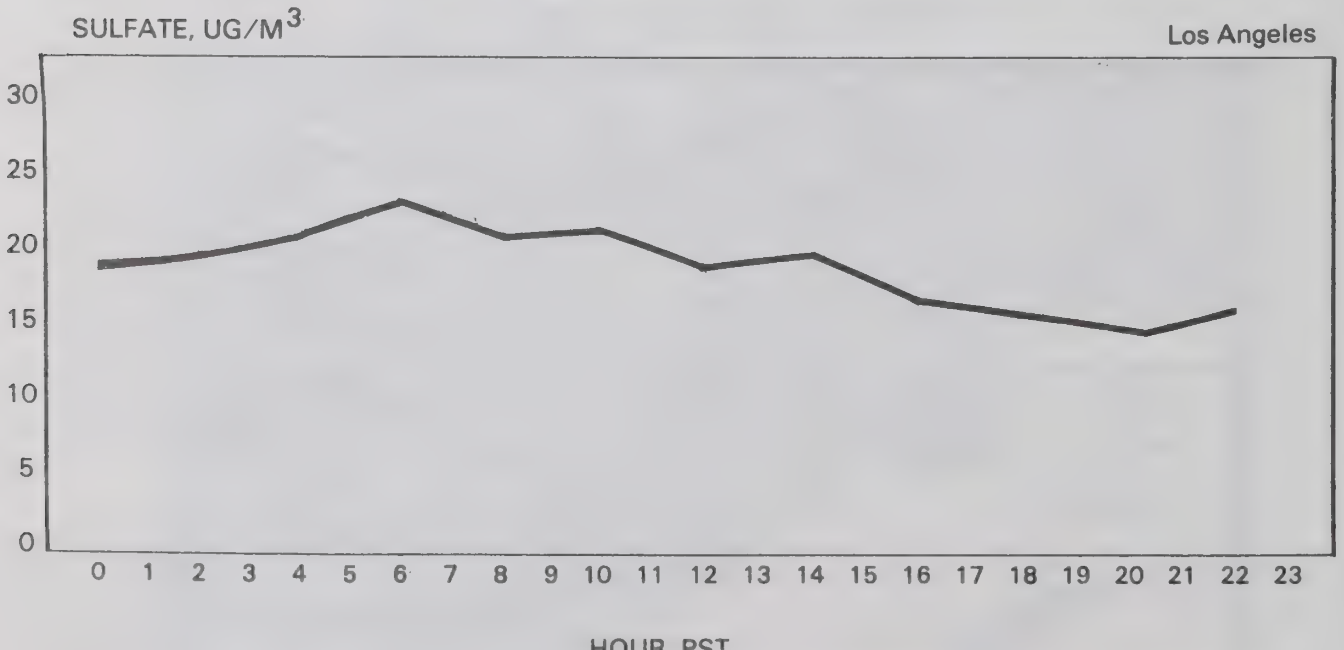



FIGURE 25. SULFATE - DIURNAL VARIATION. TWO-HOUR AVERAGES, JULY-AUGUST 1977

at Riverside. Annual average and annual maximum 24-hour average nitrate concentrations are presented for all stations in Appendix Table XIX.

## Seasonal and Diurnal Variation in Nitrate Concentrations

The seasonal nitrate pattern differs considerably with location. At Lennox, a coastal location, nitrates are at a maximum in winter and a minimum in spring and summer. Both Riverside and San Bernardino typically show a summer through fall nitrate maximum and a winter through early spring minimum.

Figure 27 shows the average nitrate concentrations for each month for 1983-1985 at Riverside. The monthly average for June was highest, and was 2.0 times the lowest monthly average for the month of December.

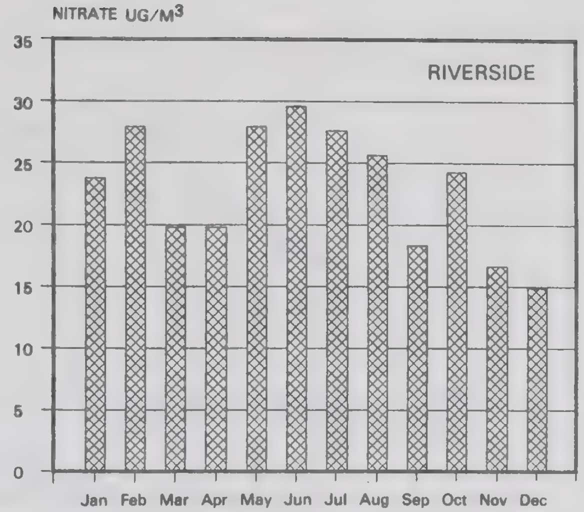
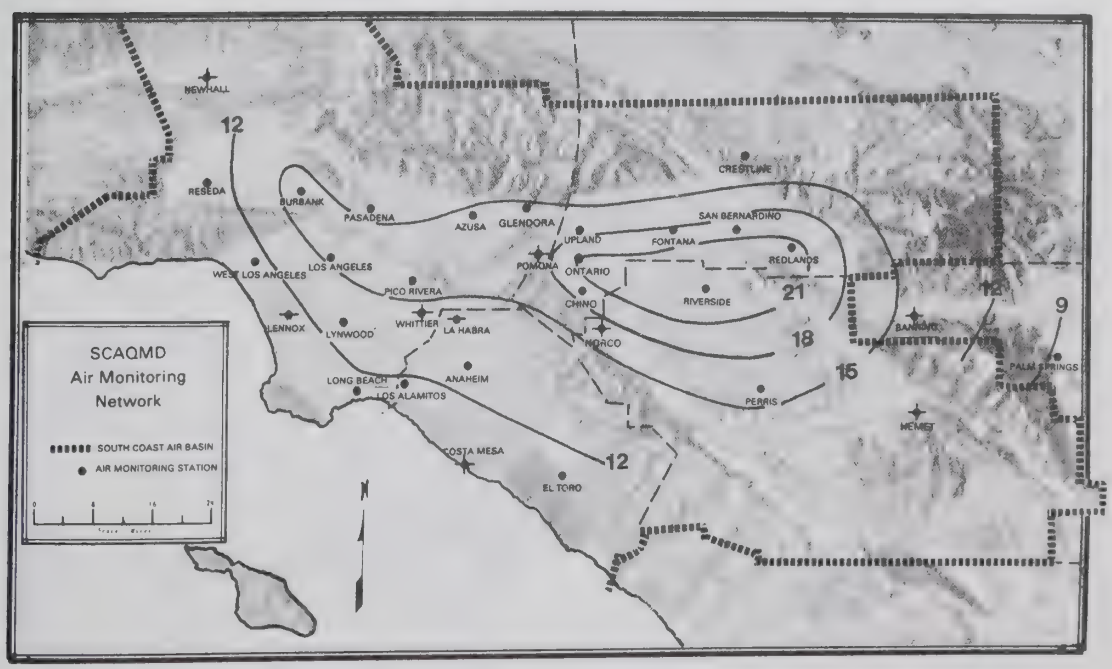



FIGURE 27. NITRATE - SEASONAL MONTHLY AVERAGES, 1983-85

The average nitrate for each 2-hour period of the day taken from Witz's data for downtown Los Angeles shows a sharp peak at 9-11 a.m. PST (see Figure 28), the same time as the maximum TSP peak. The average nitrate at 9-11 a.m. was about 20 percent of the average TSP at that time. In general, nitrate was considerably higher in the daytime than at night.

FIGURE 26
NITRATE - 1985
ANNUAL AVERAGE, ug/m$^3$




◆ Less than 12 full months of data.
✦ Not measured at this location.

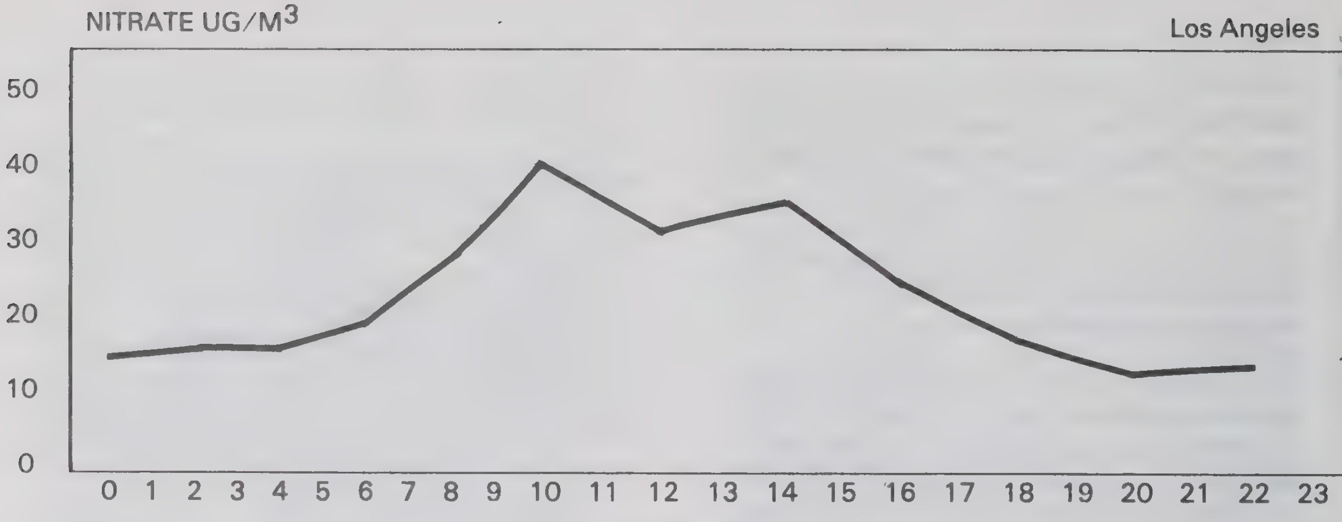



FIGURE 28. NITRATE - DIURNAL VARIATION. TWO-HOUR AVERAGES, JULY-AUGUST 1977

## VISIBILITY

### 1985 Visibility

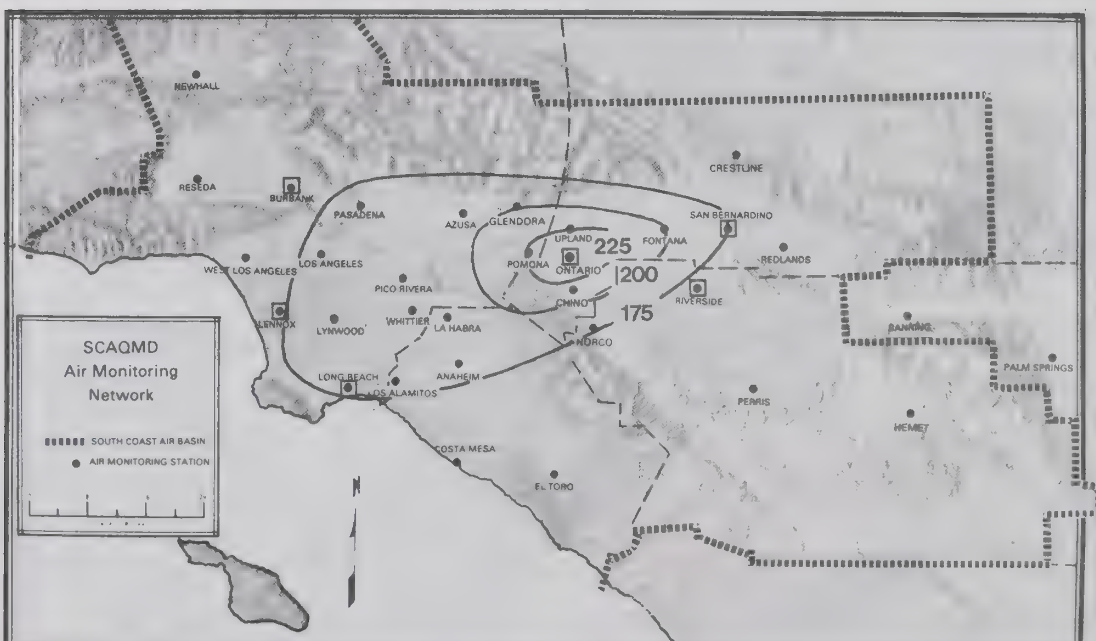
#### State Standard

Figure 29 shows the distribution by area of the number of days on which visibilities did not meet the state standard. (Less than ten miles with relative humidity less than 70 percent). The area most severely affected by these air pollution-induced low visibilities centered around Ontario International Airport. This is as expected, since this area also recorded high concentrations of TSP, sulfate, and nitrate during 1985.

### Seasonal and Diurnal Variation in Visibility

Visibility varies seasonally depending on location. Seasonal visibility patterns appear to be associated with seasonal variations in particulate contaminants. Most locations in the Basin display extremely low median visibilities (5 to 7 miles) during the summer and maximum visibility during fall and winter. The diurnal pattern agrees with the diurnal variations in aerosol concentrations.

FIGURE 29
VISIBILITY-1985
NUMBER OF DAYS VISIBILITY LESS THAN STATE STANDARD*




* Visibility less than 10 miles at relative humidity less than 70%.
Measured closest to this location, but not at the air monitoring station.

# APPENDIX

## LIST OF APPENDIX TABLES

TABLE I
1985 AIR QUALITY COMPARED TO STATE AMBIENT AIR QUALITY STANDARDS
SOUTH COAST AIR BASIN

| Pollutant/ Standard | Fraction of Basin Exceeding Standard | Most Heavily Impacted Area | Maximum[a] % of Days Exceeding Standard | Location with Maximum % of Days Exceeding Standard | Ratio of Annual Maximum to Standard |
|---|---|---|---|---|---|
| OZONE | | | | | |
| 1-hour avg. $O_3 \geq .10$ ppm | All | Inland Valleys | 51%[b] | Glendora | 3.9 |
| SUSPENDED PARTICULATE (PM10) | | | | | |
| 24-hour avg. $> 50$ ug/m$^3$ | 1/3 | Central L.A. County/ | 80%[c] | Los Angeles | 4.2 |
| Annual avg. PM10 $>30$ ug/m$^3$ | All | Inland valleys | -- | -- | 2.7 |
| CARBON MONOXIDE | | | | | |
| 8-hour Avg. $CO > 9.0$ ppm | 1/4 | Coastal/central L.A.County | 14% | Lynwood | 3.1 |
| NITROGEN DIOXIDE | | | | | |
| 1-hour avg. $NO_2 \geq .25$ ppm | 1/5 | Coastal/central L.A. County | 1% | Long Beach Pico Rivera | 1.4 |
| SULFATE | | | | | |
| 24-hour avg. $SO_4^{=} \geq 25$ ug/m$^3$ | 1/50 | Near and downwind of sulfur dioxide sources | 2% | Long Beach | 1.2 |
| SULFUR DIOXIDE | | | | | |
| 1-hour avg. $SO_2 > .25$ ppm | None (Standard Met) | Near sulfur dioxide sources | 0% | -- | 0.32 |
| LEAD | | | | | |
| Monthly avg. $Pb \geq 1.5$ ug/m$^3$ | None (Standard Met) | Coastal/central L.A. County | 0% | -- | 0.61 |

(a) Ozone, carbon monoxide, nitrogen dioxide, and sulfur dioxide are measured daily on a continuous basis and averages are reported for each hour. Suspended particulate, lead, and sulfate are sampled every sixth day and 24-hour averages are reported. The percentages given are the percent of days sampled which exceeded the standard except in the case of lead. Since the lead standard is based on a monthly average, the percent given is the percent of months not meeting the standard.

(b) Although the ozone standard was exceeded on 51 percent of the days in 1985, this does not imply that the standard was exceeded on 51 percent of the hours in 1985. A single hour above the standard during a day causes that day to be counted as exceeding. Similar reasoning applies to nitrogen dioxide and carbon monoxide.

(c) Maxima shown are selected from locations having data for at least 75% of the 61 sampling days during the period (Los Angeles data was incomplete, with exactly 75% of possible sampling days sampled).

TABLE I (Continued)

1985 AIR QUALITY COMPARED TO FEDERAL AMBIENT AIR QUALITY STANDARDS

SOUTH COAST AIR BASIN

| Pollutant/ Standard | Fraction of Basin Exceeding Standard | Most Heavily Impacted Area | Maximum[a] % of Days Exceeding Standard | Location with Maximum % of Days Exceeding Standard | Ratio of Annual Maximum to Standard |
|---|---|---|---|---|---|
| OZONE | | | | | |
| 1-hour avg. $O_3$ >.12 ppm | All | Inland Valleys | 39%[b] | Glendora | 3.3 |
| TOTAL SUSPENDED PARTICULATE (TSP) | | | | | |
| Annual avg. TSP > 75 ug/$m^3$ | 2/5 | Inland valleys | -- | -- | 1.8 |
| Annual avg. TSP > 60 ug/$m^3$ | 2/3 | | | | 2.2 |
| CARBON MONOXIDE | | | | | |
| 8-hour Avg. CO ≥ 9.3 ppm | 1/4 | Coastal/central L.A.County | 13% | Lynwood | 3.0 |
| NITROGEN DIOXIDE | | | | | |
| Annual avg. $NO_2$ > .0534 ppm | 1/50 | Coastal/central L.A. County | -- | -- | 1.1 |
| LEAD | | | | | |
| Quarterly avg. lead > 1.5 ug/$m^3$ | None (Standard Met) | Coastal/central L.A. County | 0% | -- | 0.4 |
| SULFUR DIOXIDE | | | | | |
| 24-hour avg. $SO_2$ >.14 ppm | None (Standard Met) | Near and downwind of sulfur dioxide sources | 0% | -- | 0.2 |

(a) Ozone, carbon monoxide, nitrogen dioxide, and sulfur dioxide are measured daily on a continuous basis and averages are reported for each hour. Suspended particulate, lead, and sulfate are sampled every sixth day and 24-hour averages are reported. The percentages given are the percent of days sampled which exceeded the standard except in the case of lead. Since the lead standard is based on a quarterly average, the percent given is the percent of quarters not meeting the standard.

(b) Although the ozone standard was exceeded on 39 percent of the days in 1985, this does not imply that the standard was exceeded on 39 percent of the hours in 1985. A single hour above the standard during a day causes that day to be counted as exceeding. Similar reasoning applies to carbon monoxide.

## TABLE II
## HEALTH EFFECTS OF AIR POLLUTANTS

| | | | 1985 ANNUAL HIGH CONCENTRATION IN SOCAB | |
|---|---|---|---|---|
| POLLUTANT | CONCENTRATION/ EXPOSURE TIME | OBSERVED HEALTH EFFECTS AT SPECIFIED CONCENTRATIONS | CONCENTRATION/ AVERAGING TIME | LOCATION, DATE |
| Ozone | 0.25 ppm/1 hour | Increased frequency of asthma attacks. [1,2*] | | |
| | 0.30 ppm/1 hour | Cough, chest discomfort and headache.[3] | 0.39 ppm/1 hour | Glendora 8/24/85 |
| | 0.37 ppm/2 hour | Decline in pulmonary function in healthy individuals.[4] | | |
| Carbon Monoxide | 15-18 ppm/8 hour | Can cause decreased exercise capacity in patients with angina pectoris. [6,7,8,] | 27.7 ppm/8 hour | Lynwood 12/24/85 |
| | 50 ppm/1 hour | Can cause impairment of time interval estimation and visual function.[9] | 33 ppm/1 hour | Lynwood 12/23/85 |
| Nitrogen Dioxide | 0.11 ppm/few minutes | Sensory responses may be elicited or altered.[10] | | |
| | Daily peak exceeds 0.45 ppm on 10% of days for 12 months | May cause some impairment of pulmonary function and increased incidence of acute respiratory disease.[10] | 0.35 ppm/1 hour | Long Beach 12/23/85 |
| | 1.50 ppm/short term | Can cause difficulty in breathing in healthy as well as bronchitic groups.[10] | | |
| Lead | 3.2 $ug/m^3$/7 weeks | Increase in blood lead levels which may impair or decrease hemoglobin synthesis.[11] | 0.91 $ug/m^3$ monthly average | Lynwood 1/85 |
| Sulfur Dioxide/ Total Suspended Particulate (TSP) | 0.037 ppm $SO_2$ annual average association with 100 $ug/m^3$ Smoke** | May cause higher frequencies of acute respiratory symptoms and diminished ventilatory function in children.[12] | .008 ppm $SO_2$ combined with 83 $ug/m^3$ TSP, annual average | Long Beach |

*Superscripts refer to data sources shown in References to Health Effects.
**Smoke is a British measure of particulate matter concentrations.

## TABLE III
## AIR POLLUTION DAMAGE TO PLANTS

| POLLUTANT | MOST SENSITIVE SPECIES AND LOWER CONCENTRATION LIMIT FOR INJURY | TYPICAL SYMPTOMS - CONCENTRATION OF FIRST APPEARANCE VARIES WITH SPECIES AND ENVIRONMENTAL FACTORS | OTHER SENSITIVE PLANTS |
|---|---|---|---|
| Ozone $O_3$ | .05-.12 ppm, 2-4 hours<br>Tobacco, spinach, beans | Shiny, oily or waxy appearance on upper Leaf surface may occur during exposure. Red-brown spots or bleaching to tan or white on upper surface or on both surfaces. Reduced plant growth. | Alfalfa, potatoes, corn grapes, alder, ponderosa pine, sycamore. |
| Peroxyacetyl Nitrate (PAN)<br>O<br>II<br>$CH_3COONO_2$ | .015-.020 ppm, 4 hour<br>Tomato, romaine lettuce, petunia. | Oily or waxy appearance develops 2-3 hours after exposure. Lower leaf surface gradually develops glazed or bronzed appearance. Bronzing usually develops after 2-3 days. White or occasionally brown bands from a few mm to a few cm wide develop on leaves, the position of the band varying with leaf age. Decresed crop yield. | Beans, head lettuce, oat, alfalfa, barley. sugar beet, carrot. |
| Sulfur dioxide $SO_2$ | .24 ppm $SO_2$ combined with .037 ppm $O_3$ (background level $O_3$)<br>Tobacco. | Chronic low-level exposure gives mild chlorosis (yellowing) of leaves, or a silvering or bronzing of the underside. High level exposure first causes water soaked discolored appearance of injured area, which on drying typically becomes white to ivory. Ragged appearance of leaves. Leaf drop. | Alfalfa, barley, beans cotton, oat, ponderosa pine. |
| Nitrogen dioxide $NO_2$ | 2.5-3.0 ppm, 2 hour<br>Pinto bean, tomato, Cucumber. | Symptoms similar to $SO_2$ but higher concentrations required to produce. white to tan areas on leaves. When dry, resembles tissue paper. Leaves age prematurely, drop. | Head lettuce, orange. |
| Carbon Monoxide | Well above ambient | Similar to ethylene but much higher concentrations required. | -- |
| Ethylene | .001-.005 ppm 24-30 hr.<br>.1 ppm, 6 hour<br>African marigold, rose, orchid, cotton, tomato, peach. | Acts as growth hormone. Causes general reduction in growth as well as abnormal growth. Buds drop, flowers fail to open. | Carrot, squash. |
| Total suspended particulate | -- | Not generally considered harmful. May increase costs of crops due to increased labor for cleaning. | -- |
| Acid precipitation | -- | Dead spots in foliage. Increased acidity of natural waters which may affect aquatic species. | |

References:

1) Recognition of Air Pollution Injury to Vegetation: A Pictorial Atlas, Air Pollution Control Association and National Air Pollution Control Administration, 1970. Edited by J.S. Jacobsen and A. Clyde.
2) Air Pollution, Vol. II, Third Edition "The Effects of Air Pollution" Edited by A. C. Stern.
3) Air Pollution Damage to Vegetation, Editor J. A. Naegele.
4) Air Pollution Effects on Plant Growth, Editor M. Dugger.

TABLE IV
AIR POLLUTION DAMAGE TO MATERIALS

| POLLUTANT | LOWER CONCENTRATION LIMIT | MATERIAL | EFFECTS OF POLLUTANT ON MATERIAL AT SPECIFIC CONCENTRATION |
|---|---|---|---|
| Ozone ($O_3$) | .01-.02 ppm | Rubber[1,2] | Rubber under tension oxidizes causing decreased tensile strength and resilience, and cracking. Susceptibility to ozone varies with the type of rubber. |
| | .02-.06 ppm for 50 days | Fabrics[2] | Cotton is weakened in the presence of moisture, showing decreased breaking strength. |
| | -- | Fabric Dyes | A type of blue dye developed to resist $NO_2$ attack (gas fading) failed field tests and was subsequently found to be suffering damage from ozone. |
| Sulfur Dioxide ($SO_2$) | -- | Building[1] Materials | Limestone, marble, roofing slate, and mortar are attacked by $SO_2$ |
| | -- | Metals[1] | In the presence of moisture, $SO_2$ attacks iron, copper and galvanized or zinc-coated iron or steel products. Aluminum is resistant to $SO_2$. The greatest part of the economic loss due to $SO_2$ is due to attack on metals. |
| | -- | Electrical[3] Devices | Corrosion and tarnishing of electrial contacts by $SO_2$ contributes to failure of electrical devices. This accounts for about 5% of the economic loss due to $SO_2$. |
| | 2.-9. ppm for 10 days | Paper[1] | At these high concentrations, paper becomes brittle and a decrease in folding resistance is observed. |
| | -- | Leather[1] | $SO_2$ causes leather to lose strength and eventually disintegrate. |
| | -- | Textiles[1] | Cotton and wool are weakened by $SO_2$. Nylon hose, which are made up of very thin fibers and are under tension, deteriorate rapidly. Heavier nylon fibers don't suffer noticeably. |
| | 1-5 ppm and higher | Plastics and[5] other Polymers | High $SO_2$ concentration have been shown to slightly increase deterioration of some plastics and other polymers over what normally occurs in presence of air and light. |
| Carbon Dioxide ($CO_2$) | -- | Building[1] Materials | $CO_2$ occurs in the atmosphere naturally, but is present in much greater amount in industrialized areas due to combustion of fossil fuels. In the presence of water, carbonic acid is formed and will attack limestone. |
| Particulates | -- | Painted[1,3] Surfaces | Painted surfaces such as the exterior of an automobile may be damaged by particulates containing reactive chemicals. Absorbed $SO_2$, iron filings and mortar dust from building demolition are examples of such reactive materials which have been reported to cause paint damage. |
| | -- | Electrical[3] Devices | Most of the damage to electrical components by air pollution has been attributed to particulates. |
| Nitrogen Dioxide ($NO_2$) | -- | Fabric[4] | Either ambient $NO_2$ or $NO_2$ produced by gas appliances can cause some dyes to fade ("gas fading"). |

(1) J.E. Yocom, "The Deterioration of Materials in Polluted Atmospheres" J. Air Poll. Control Assoc., Vol. 8, No. 3, p. 203

(2) L.S. Jaffe, " The Effects of Photochemical Oxidants on Materials" J. Air Poll. Control Assoc. Vol. 17, No. 6, p. 375

(3) "Sulfur Dioxide and Material Damage", D.G. Gillette, J. Air Poll. Control Assoc., Vol. 13, No. 9, p. 1238.

(4) V.S. Salvin, "Effect of Air Pollutants on Dyed Fabrics" J. Air Poll. Control Assoc., Vol. 13, No. 9, p. 416, 1963.

(5) H.H.G. Jellinek, "Chain Scission of Polymers by Small Concentrations (1 to 5 ppm) of Sulfur Dioxide and Nitrogen Dioxide, Respectively, in presence of Air and Near Ultraviolet Radiation." J. Air Poll. Control Assoc., Vol. 20. No. 10, p. 672, 1970.

TABLE V
AMBIENT AIR QUALITY STANDARDS

| | CALIFORNIA | | FEDERAL | | |
|---|---|---|---|---|---|
| AIR POLLUTANT | CONCENTRATION | DISTRICT METHOD | PRIMARY ($>$) | SECONDARY ($>$) | METHOD[a] |
| Ozone | 0.10 ppm, 1-hr. avg. $\geq$ | U.V. Photometry | 0.12 ppm, 1-hr. avg. | 0.12 ppm, 1-hr. avg. | Chemiluminescent |
| Carbon Monoxide | 9.0 ppm, 8-hr. avg.[b)] $>$<br>20 ppm, 1-hr. avg. $>$ | Non-dispersive Infra-red Spectrophotometry | 9 ppm, 8-hr. avg.[e)]<br>35 ppm, 1-hr. avg. | 9 ppm, 8-hr. avg.<br>35 ppm, 1-hr. avg. | Non-dispersive Infra-red Spectrophotometry |
| Nitrogen Dioxide | 0.25 ppm, 1-hr. avg. $\geq$ | Gas Phase Chemiluminescence | 0.053 ppm, annual avg.[f)] | 0.053 ppm, annual avg. | Gas Phase Chemiluminescence |
| Sulfur Dioxide | 0.05 ppm, 24-hr. avg. $\geq$ with Ozone $\geq$ 0.10 ppm, 1-hr. avg. or TSP $\geq$ 100 ug/m$^3$, 24-hr. avg.<br>0.25 ppm, 1-hr. avg.[c)] $>$ | Pulsed Fluorescence | 0.03 ppm, annual avg.<br>0.14 ppm, 24-hr. avg. | 0.5 ppm, 3-hr. avg. | Para-rosaniline |
| Total Suspended Particulate (TSP) | | | 75 ug/m$^3$, annual geometric mean<br>260 ug/m$^3$, 24-hr. avg. | 60 ug/m$^3$, annual geometric mean<br>150 ug/$^3$, 24-hr. avg. | High Volume Sampling |
| Suspended Particulate Matter (PM10) | 30 ug/m$^3$, annual geometric mean[d)] $>$<br>50 ug/m$^3$, 24-hr. avg. $>$ | Size Segregated Inlet High Volume Sampling | | | |
| Sulfates | 25 ug/m$^3$, 24-hr. avg. $\geq$ | High Vol. Sampling Methyl-thymol Blue | - | - | - |
| Lead | 1.5 ug/m$^3$, 30-day avg. $\geq$ | High Vol. Sampling X-Ray Fluorescence | 1.5 ug/m$^3$, calendar quarter | 1.5 ug/m$^3$, calendar quarter | High Volume Sampling Atomic Absorption Spectrophotometry |
| Hydrogen Sulfide | 0.03 ppm, 1-hr avg. $\geq$ | Cadmium Hydroxide Stractan | - | - | - |
| Vinyl Chloride | 0.010 ppm, 24-hr. avg. $\geq$ | Gas Chromatography | - | - | - |
| Visibility Reducing Particles | In sufficient amount to reduce the prevailing visibility to less than 10 miles at relative humidity less than 70%, 1 obs. | - | - | - | - |

a) Reference method as described by the federal government. An equivalent method of measurement may be used as approved by the federal government.
b) Effective December 15, 1982. The standards were previously 10 ppm, 12-hour average and 40 ppm, 1-hour average.
c) Effective October 5, 1984. The standard was previously .5 ppm, 1 hour average.
d) Effective August 19, 1983. The standards were previously 60 ug/m$^3$ TSP, annual geometric mean, and 100 ug/m$^3$ TSP, 24-hour average.
e) Effective September 13, 1985, standard changed from $>$10 mg/m$^3$ ($\geq$9.3 ppm) to $>$9 ppm ($\geq$9.5 ppm).
f) Effective July 1, 1985 standard changed from $>$100 ug/m$^3$ ($>$.0532 ppm) to .053 ppm ($>$.0534 ppm).
$>$ To violate standard concentration must be greater than ( $>$ ) standard.
$\geq$ To violate standard concentration must be greater than or equal to ( $\geq$ ) standard.

TABLE VI
EPISODE CRITERIA

| | SCAQMD AND CALIFORNIA | | | FEDERAL | | |
|---|---|---|---|---|---|---|
| AIR POLLUTANT | STAGE 1 ($\geq$) | STAGE 2 ($\geq$) | STAGE 3 ($\geq$) | STAGE 1 ($\geq$) | STAGE 2 ($\geq$) | STAGE 3 ($\geq$) |
| Ozone | 0.20 ppm, 1-hr. avg. | 0.35 ppm, 1-hr. avg. | 0.50 ppm, 1-hr. avg. | - | - | |
| Carbon Monoxide | 40 ppm, 1-hr. avg.<br>20 ppm, 12-hr. avg. | 75 ppm, 1-hr. avg.<br>35 ppm, 12-hr. avg. | 100 ppm, 1-hr. avg.<br>50 ppm, 12-hr. avg. | 15 ppm, 8-hr. avg. | 30 ppm, 8-hr. avg. | 40 ppm, 8-hr. avg. |
| Nitrogen Dioxide | - | - | - | 0.60 ppm, 1-hr. avg.<br>0.15 ppm, 24-hr. avg. | 1.20 ppm, 1-hr. avg.<br>0.30 ppm, 24-hr. avg. | 1.60 ppm, 1-hr. avg.<br>0.40 ppm, 24-hr. avg. |
| Sulfur Dioxide | 0.50 ppm, 1-hr. avg.<br>0.20 ppm, 24-hr. avg. | 1.00 ppm, 1-hr. avg.<br>0.70 ppm, 24-hr. avg. | 2.00 ppm, 1-hr. avg.<br>0.90 ppm, 24-hr. avg. | - | - | - |
| Sulfur Dioxide/ Total Suspended Particulate Combined | - | - | - | 65,000*, 24-hr. avg. | 261,000*, 24-hr. avg. | 393,000* 24-hr. avg. |
| Total Suspended Particulate (TSP) | - | - | - | 375 ug/m$^3$, 24-hr. avg. | 625 ug/m$^3$, 24-hr. avg. | 875 ug/m$^3$, 24-hr. avg. |
| Sulfates** | 25 ug/m$^3$, 24-hr. avg. combined with ozone $\geq$ 0.20 ppm, 1-hr. avg. | | | - | - | - |
| Actions to be Taken | Health advisory to a) Persons with respiratory and coronary disease. b) School officials in order to curtail students' participation in strenuous activities. First steps in abatement plans. | Intermediate Stage. Abatement actions taken to reduce concentration of pollutant at issue. | Mandatory abatement measures, Extensive actions taken to prevent exposure at indicated levels. State can take action if local efforts failed | Open burning prohibited. Reduction in vehicle operation requested. Industrial curtailment. | Incinerator use prohibited. Reduction in vehicle operation required. Further industrial curtailment. | Vehicle use prohibited Industry shut down or curtailment. Public activities ceased. |

*Product of sulfur dioxide (ppm), particulate matter (ug/m$^3$) and a factor (2620).

**Episodes based upon these criteria are not classified according to stages.

TABLE VII
OZONE - 1985
Comparison to Air Quality Criteria

| Station No., Location | Number of Days in 1985 Max. 1-Hr Avg. Exceeded: State Std >=.10 ppm | Fed Std >.12 ppm | Stg 1 Epsd >=.20 ppm | Stg 2 Epsd >=.35 ppm | Max 1-Hr ppm | Ann Avg Daily Max | Ann Avg | Total Number Days |
|---|---|---|---|---|---|---|---|---|
| 600 Azusa | 166 | 117 | 48 | 1 | .36 | .1004 | .0302 | 365 |
| 690 Burbank | 141 | 87 | 17 | 0 | .30 | .0865 | .0260 | 364 |
| 720 Long Beach | 29 | 11 | 1 | 0 | .23 | .0499 | .0200 | 364 |
| 740 Reseda | 133 | 75 | 9 | 0 | .25 | .0813 | .0279 | 362 |
| 750 Pomona | 138 | 98 | 32 | 0 | .33 | .0868 | .0252 | 365 |
| 760 Lennox | 11 | 4 | 0 | 0 | .17 | .0431 | .0176 | 357 |
| 800 Whittier | 95 | 58 | 11 | 0 | .32 | .0750 | .0248 | 365 |
| 820 Lancaster** | 106 | 58 | 0 | 0 | .19 | .0755 | .0398 | 362 |
| 840 Lynwood | 41 | 16 | 1 | 0 | .21 | .0535 | .0178 | 365 |
| 850 Pico Rivera | 120 | 79 | 19 | 0 | .31 | .0822 | .0231 | 365 |
| 870 Los Angeles | 107 | 56 | 9 | 0 | .30 | .0729 | .0211 | 365 |
| 880 Pasadena | 173 | 116 | 41 | 1 | .37 | .1045 | .0337 | 365 |
| 890 Newhall | 141 | 93 | 15 | 0 | .24 | .0831 | .0280 | 363 |
| 910 West L.A , VA. | 82 | 37 | 4 | 0 | .27 | .0711 | .0252 | 365 |
| 591 Glendora | 187 | 141 | 68 | 5 | .39 | .1153 | .0387 | 365 |
| 3176 Anaheim | 70 | 35 | 11 | 0 | .25 | .0658 | .0231 | 365 |
| 3177 La Habra | 93 | 57 | 13 | 0 | .34 | .0755 | .0263 | 365 |
| 3186 El Toro | 61 | 30 | 7 | 0 | .28 | .0676 | .0324 | 363 |
| 3190 Los Alamitos | 30 | 11 | 0 | 0 | .19 | .0500 | .0183 | 364 |
| 3192 Costa Mesa | 33 | 17 | 1 | 0 | .21 | .0583 | .0280 | 364 |
| 4137 Palm Springs** | 81 | 25 | 2 | 0 | .24 | .0669 | .0375 | 365 |
| 4139 Indio** | 67 | 16 | 1 | 0 | .20 | .0657 | .0360 | 365 |
| 4141 Hemet | 52 | 13 | 1 | 0 | .23 | .0630 | .0337 | 365 |
| 4144 Rubidoux | 173 | 125 | 35 | 1 | .35 | .1023 | .0372 | 364 |
| 4149 Perris | 146 | 96 | 8 | 0 | .29 | .0871 | .0364 | 365 |
| 4150 Banning** | 94 | 55 | 8 | 0 | .29 | .0692 | .0360 | 364 |
| 4155 Norco | 147 | 92 | 20 | 1 | .35 | .0907 | .0339 | 364 |
| 5175 Upland | 156 | 110 | 39 | 0 | .33 | .0965 | .0317 | 365 |
| 5181 Crestline | 160 | 114 | 41 | 0 | .30 | .1015 | .0528 | 365 |
| 5192 Redlands | 158 | 113 | 31 | 0 | .33 | .0977 | .0412 | 359 |
| 5194 San Bernardino | 155 | 111 | 30 | 0 | .27 | .0940 | .0340 | 362 |
| 5197 Fontana | 162 | 126 | 48 | 0 | .34 | .1037 | .0354 | 360 |
| 5198 Chino | 136 | 85 | 15 | 0 | .32 | .0870 | .0287 | 365 |

*Less than 12 full months of data.
**Southeast Desert Air Basin.

*Std* = Standard. Fed = Federal. Epsd = Episode.
Max = Maximum.
Ann Avg = annual average (arithmetic mean) in ppm (parts per million by volume).
Ann Avg Daily Max = annual average daily maximum.
Annual average daily maximum 1-hour average ozone more accurately reflects where peak 1-hour levels (which determine compliance with standards and episodes) occur, than does the annual average ozone.

ANNUAL NUMBER OF DAYS OF FIRST/SECOND STAGE EPISODES
(days maximum 1-hour average ozone > =0.20 ppm / > =0.35 ppm)

1976-1985

| STATION | | | YEAR | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| # | LOCATION | CODE | 1976 | 1977 | 1978 | 1979 | 1980 | 1981 | 1982 | 1983 | 1984 | 1985 |
| 600 | Azusa | AZUS | 47/1 | 64/0 | 76/5 | 71/10 | 74/7 | 65/2 | 40/1 | 63/3 | 55/0 | 48/1 |
| 690 | Burbank | BURK | 43/1 | 11/0 | 30/0 | 26/2 | 30/1 | 18/0 | 12/0 | 34/0 | 5/0 | 17/0 |
| 720 | Long Beach | LB | 0/0 | 0/0 | 0/0 | 1/0 | 1/0 | 1/0 | 1/0 | 1/0 | 1/0 | 1/0 |
| 740 | Reseda | RESE | 33/0 | 37/0 | 16/0 | 24/0 | 36/1 | 12/0 | 4/0 | 11/0 | 6/0 | 9/0 |
| 750 | Pomona | POMA | 37/1 | 58/0 | 72/9 | 57/3 | 49/1 | 32/0 | 31/0 | 45/0 | 30/0 | 32/0 |
| 760 | Lennox | LENX | 1/0 | 0/0 | 2/0 | 0/0 | 0/0 | 0/0 | 0/0 | 0/0 | 1/0 | 0/0 |
| 800 | Whittier | WHIT | 19/1 | 12/0 | 18/1* | 16/0 | 5/0 | 18/0 | 7/0 | 23/0 | 17/0 | 11/0 |
| 820 | Lancaster | LANC** | 0/0 | 2/0 | 5/0 | 1/0 | 7/0* | 7/0 | 0/0 | 0/0 | 0/0 | 0/0 |
| 840 | Lynwood | LYNW | 2/0* | 0/0* | 0/0 | 6/0 | 0/0* | 1/0 | 2/0 | 3/0 | 4/0 | 1/0 |
| 850 | Pico Rivera | PICO | 26/1* | 52/0 | 48/5 | 38/3 | 38/1 | 28/0 | 18/1 | 35/0 | 24/0 | 19/0 |
| 860 | West L.A. | WLA | 4/0 | 0/0 | 10/0* | 7/0 | 3/0 | 3/0 | 3/0 | 6/0 | 5/0 | 4/0 |
| 870 | Los Angeles | LA | 11/0 | 3/0 | 16/0 | 14/0 | 10/0 | 8/0 | 7/1 | 12/0 | 8/0 | 9/0 |
| 880 | **Pasadena** | PASA | 51/0 | 55/0 | 85/8 | 78/11 | 56/3 | 48/0 | 33/1 | 59/0 | 49/0 | 41/1 |
| 890 | Newhall | NEWL | 38/0 | 59/0 | 45/0 | 59/0 | 46/2 | 37/0 | 17/0 | 19/0 | 18/0 | 15/0 |
| 591 | Glendora | GLEN | / | / | / | / | 30/5* | 61/2 | 62/2 | 74/2 | 67/0 | 68/5 |
| 3176 | Anaheim | ANAH | 4/0* | 0/0* | 13/0 | 5/0 | 6/0 | 5/0 | 7/0 | 10/0 | 5/0 | 11/0 |
| 3177 | La Habra | LAHB | 15/0 | 8/0 | 24/1 | 21/1 | 14/0 | 15/0 | 12/0 | 15/0 | 15/0 | 13/0 |
| 3186 | El Toro | TORO | 3/0 | 2/0 | 10/0 | 6/0 | 3/0 | 5/0 | 3/0 | 10/0 | 3/0 | 7/0 |
| 3188 | San Juan Cap. | SJCA | 2/0* | 1/0 | 2/0* | / | / | / | / | / | / | / |
| 3190 | Los Alamitos | LSAL | 2/0 | 0/0* | 5/0 | 2/0 | 3/0 | 0/0 | 2/0 | 2/0 | 0/0 | 0/0 |
| 3191 | Santa Ana Cyn. | SACN | 17/0 | 10/0 | 9/0 | 14/2 | 13/0 | 4/0* | / | / | / | / |
| 3192 | Costa Mesa | COST | 0/0 | 0/0* | 3/0 | 1/0 | 0/0 | 1/0 | 0/0 | 2/0 | 1/0 | 1/0 |
| 4137 | Palm Springs | PLSP** | 3/0* | 5/0 | 3/0 | 3/0* | 4/0 | 0/0 | 0/0 | 0/0 | 1/0 | 2/0 |
| 4139 | Indio | INDO** | 0/0* | 0/0 | 0/0 | 1/0 | 0/0 | 0/0 | 0/0 | 0/0 | 0/0 | 1/0 |
| 4141 | Hemet | HEME | 0/0 | 2/0 | 2/0* | / | / | / | / | / | / | 1/0 |
| 4144 | Riverside Rub. | RIVR | 46/2 | 66/1 | 62/2 | 55/0 | 67/4 | 34/0 | 26/0 | 42/1 | 29/0 | 35/1 |
| 4149 | Perris | PERI | 13/0 | 39/0 | 38/0 | 26/0 | 20/0 | 18/0 | 10/0 | 13/0 | 6/0 | 8/0 |
| 4150 | Banning | BANN** | 20/0* | 13/0 | 22/0 | 22/0 | 13/0 | 7/0 | 3/0 | 12/0 | 5/0 | 8/0 |
| 4155 | Norco | NORC | 26/0 | 31/1 | 34/2 | 24/0 | 32/0 | 24/1 | 15/1 | 29/1 | 19/0* | 20/1 |
| 5155 | Barstow | BARS** | 0/0* | 1/0 | 0/0 | 0/0 | 0/0 | 0/0* | 0/0* | / | / | / |
| 5175 | Upland | UPLA | 61/1 | 85/2 | 68/2 | 59/2 | 73/4 | 62/1 | 0/0* | 59/1 | 41/0 | 39/0 |
| 5181 | Crestline | CRES | 11/0 | 63/0 | 73/0 | 80/3 | 54/0 | 49/1 | 29/0 | 48/0 | 49/0 | 41/0 |
| 5182 | Yucaipa | YUCI | 28/0 | 39/0 | 56/0 | 0/0* | 67/0 | 19/0* | / | / | / | |
| 5188 | Trona | TRON** | / | / | 0/0* | 0/0* | 0/0* | 0/0* | 0/0* | | | |
| 5190 | Victorville | VCVL** | 0/0* | 1/0 | 1/0 | 3/0 | 5/0 | 3/0 | 1/0* | / | / | / |
| 5192 | Redlands | REDL | 25/1 | 48/0 | 64/2 | 57/0 | 61/0 | 20/0 | 30/0 | 41/0 | 26/0 | 31/0 |
| 5194 | San Bernardino | SNBD | 51/0 | 70/1 | 72/1 | 62/0 | 72/2 | 58/1 | 38/0 | 49/0 | 36/0 | 30/0 |
| 5197 | Fontana | FONT | 69/1 | 98/6 | 98/11 | 95/9 | 84/6 | 73/1 | 34/0 | 56/0 | 45/0 | 48/0 |
| 5198 | Chino | CHIN | 39/1 | 42/3 | 22/2* | / | / | / | / | / | / | 15/0 |
| | SOUTH COAST AIR BASIN | | 100/7 | 121/11 | 117/23 | 120/17 | 101/15 | 100/5 | 63/2 | 84/3 | 97/0 | 83/7 |

*Less than 12 full months of data
**Southeast Desert Air Basin. San Bernardino County SEDAB stations are operated by San Bernardino County APCD.

# TABLE IX

## OZONE - ANNUAL MAXIMUM 1-HOUR, PPM

## 1955 - 1985

YEAR

| STATION | 1955 | 1956 | 1957 | 1958 | 1959 | 1960 | 1961 | 1962 | 1963 | 1964 | 1965 | 1966 | 1967 | 1968 | 1969 | 1970 | 1971 | 1972 | 1973 | 1974 | 1975 | 1976 | 1977 | 1978 | 1979 | 1980 | 1981 | 1982 | 1983 | 1984 | 1985 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Los Angeles | .68 | .47 | .53/ | .61 | .61* | .41 | .45 | .50 | .50 | .46 | .58 | .50 | .36 | .46 | .30 | .33 | .24 | .25 | .52 | .25 | .25 | .34 | .21 | .30 | .31/ | .29 | .32 | .40 | .26 | .29 | .30 |
| Azusa | - | - | .42 | .45 | .56 | .49. | .45 | .43 | .34 | .40 | .54 | .53 | .65 | .44 | .54 | .58 | .48 | .49 | .46 | .38 | .32 | .38 | .32 | .40 | .45 | .41 | .35 | .36 | .39 | .31 | .36 |
| Burbank | | .33 | .43 | .39 | .47 | .33 | .33/ | .33 | .38 | .39 | .40 | .32 | .47 | .42 | .38 | .35 | .31 | .28 | .29 | .35 | .27 | .35 | .31 | .30 | .39 | .35 | .27 | .25 | .31 | .26 | .30 |
| West Los Angeles | - | - | - | - | - | - | - | .40* | .40 | .32 | .39 | .29 | .36 | .44 | .30 | .24 | .26 | .19 | .39 | .19 | .19 | .28 | .18/ | .24/ | .26 | .21 | .23 | .28 | .23 | .27/ | .27 |
| Long Beach | - | - | - | .37 | .30 | .37 | .34 | .33/ | .28 | .27 | .34 | .27 | .21 | .33 | .22 | .18 | .27 | .17 | .20 | .27 | .14 | .16 | .15 | .19 | .21 | .20 | .23 | .22 | .30 | .27 | .23 |
| Reseda | - | - | - | - | - | - | - | - | | - | .47 | .44 | .41 | .34 | .39 | .37 | .32 | .29 | .28 | .28 | .30 | .27 | .34 | .27 | .33 | .38 | .25 | .22 | .26 | .26 | .25 |
| Pomona | - | - | - | - | - | - | - | - | | - | .44* | .44 | .43 | .49 | .45 | .48 | .35 | .37 | .32 | .31 | .33 | .36 | .32 | .41 | .35 | .37 | .33 | .31 | .34 | .31 | .33 |
| Lennox | - | - | - | - | - | - | - | - | | - | .32 | .37 | .33 | .23 | .25 | .23 | .21 | .17 | .24 | .15 | .18 | .22 | .17 | .30 | .19 | .11 | .19 | .16 | .18 | .22 | .17 |
| Whittier | - | - | - | - | - | - | - | - | | - | - | - | - | - | .43* | .36 | .39 | .29 | .28 | .35 | .25 | .37 | .30 | .36 | .32 | .27 | .27 | .31 | .32 | .30 | .32 |
| Newhall | - | - | - | - | - | - | - | - | | - | - | - | - | - | .20* | .41 | .30 | .29 | .36 | .26 | .30 | .33 | .33 | .32 | .32 | .36 | .29 | .26/ | .29 | .27 | .24 |
| Lancaster | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | .06* | .20 | .16 | .21 | .15 | .19 | .19 | .23 | .27 | .20 | .29 | .21 | .16 | .18 | .18 | .19 |
| Pasadena | - | .46 | .36/ | .44* | .47 | .54 | .44 | .46 | .41 | .42 | .46 | .43 | .40/ | .48* | .52 | .51 | .53/ | .38* | .45 | .34 | .32 | .34 | .32 | .42 | .44 | .41 | .33 | .37/ | .34 | .30 | .37 |
| Lynwood | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | .22* | .28 | .19 | .24 | .24 | .18 | .29 | .18 | .21 | .26 | .23 | .27 | .21 |
| Pico Rivera | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | .35 | .32 | .43 | .39 | .39 | .35 | .39 | .33 | .27 | .31 |
| Glendora | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | .49 | .39 | .36 | .38 | .34 | .39 |
| Anaheim | - | - | - | - | - | - | - | - | .27 | .23 | .41 | .31 | .30 | .28 | .30 | .29 | .34 | .28 | .26 | .24 | .13* | .30 | .19 | .29 | .33 | .28 | .26 | .26 | .30 | .25 | .25 |
| La Habra | - | | | | | | | | | | | | .23* | .26 | .43 | .30 | .34 | .32 | .30 | .44 | .28 | .30 | .25 | .35 | .38 | .31 | .27 | .32 | .27 | .32 | .34 |
| Costa Mesa | - | | | | | | | | | | | | - | - | - | - | - | .19 | .21 | .22 | .18 | .16 | .18 | .22 | .21/ | .16 | .20 | .18 | .25 | .25 | .21 |
| El Toro | - | | | | | | | | | | | | - | - | - | - | - | - | .19 | .38 | .19 | .23 | .20 | .34 | .32 | .34 | .33 | .27 | .29 | .30 | .28 |
| San Juan Capristrano | - | | | | | | | | | | | | - | - | - | - | - | - | .20 | .25 | .18 | .20 | .22 | .32 | - | - | - | - | - | - | .19 |
| Laguna | - | | | | | | | | | | | | - | - | - | - | - | - | - | .16 | .08* | - | - | - | - | - | - | - | - | - | - |
| Los Alamitos | - | | | | | | | | | | | | - | - | - | - | - | .14 | - | .27 | .21 | .26 | .18 | .27 | .26 | .22 | .18 | .23 | .20 | .19 | .19 |
| Santa Ana Canyon | - | | | | | | | | | | | | - | - | - | - | - | - | - | .11 | .33 | .33 | .30 | .27 | .39 | .33 | .23* | - | - | - | |
| Palm Springs | - | | | | | | | | | | | | - | - | - | - | .31 | .25 | .25 | .24 | .21 | .22 | .21 | .20 | .24 | .21 | .19 | .19 | .19 | .20 | .24 |
| Indio | - | | | | | | | | | | | | - | - | - | - | .26 | .20 | .17 | .18 | .20 | .16 | .19 | .17 | .21 | .11 | .18 | .17 | .18 | .19 | .20 |
| Prado Park/Norco | - | | | | | | | | | | | | - | - | - | - | .05* | .30 | .35 | .31 | .15* | .33 | .36 | .40 | .33/ | .34 | .37 | .35 | .35 | .30 | .35 |
| Hemet | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | .22 | .20 | .18 | .19 | .25 | .27 | - | - | - | - | - | .18* | .23 |
| Riverside | - | - | - | - | - | - | - | - | .28 | .40 | .29 | .31 | .40 | .34* | - | | .45 | .40*/ | .31 | .32 | .35 | .36 | .35 | .39 | .34 | .37 | .30 | .31 | .36 | .32 | .35 |
| Perris | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | .27* | .26 | .27 | .22 | .28 | .32 | .25 | .29 | .24 | .28 | .26 | .22 | .29 |
| Banning | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | .37 | .19 | .26 | .32* | .24 | .27 | .28 | .27 | .30 | .27 | .26 | .23 | .24 | .26 | .25 | .29 |
| Temecula | - | - | - | - | - | - | - | - | | | | | - | - | - | - | - | - | - | .15 | .18 | .21 | .17 | .23 | - | - | - | - | - | - | - |
| Elsinore | - | - | - | - | - | - | - | - | | | | | - | - | - | - | - | - | - | .23* | .30 | .20 | .23 | .30 | - | - | - | - | - | | - |
| San Bernardino | - | - | - | - | - | - | - | - | .28 | .32 | .32 | .31 | .33 | .28 | .27 | .36 | .26 | .34 | .34 | .27 | .38 | .32 | .37 | .36 | .34 | .36 | .36/ | .30 | .32 | .30 | .27/ |
| Barstow | - | - | - | - | - | - | - | - | - | - | - | - | - | - | .10 | .11* | .06* | .06* | .08* | .12 | .12 | .14* | .20 | .16 | .16 | .19 | .16 | .16 | - | - | - |
| Redlands | - | - | - | - | - | - | - | - | - | - | - | - | .12* | .32 | .30 | .42 | .28 | .31 | .34 | .31 | .32 | .35 | .33 | .39 | .34/ | .32 | .24 | .29 | .30 | .29 | .33 |
| Victorville | - | - | - | - | - | - | - | - | - | - | - | - | - | .09* | .14 | .18* | .11 | .12 | .19 | .16 | .16 | .13* | .22 | .21/ | .21 | .26 | .21 | .20 | - | - | - |
| Chino | - | - | - | - | - | - | - | - | - | - | - | .32* | .21 | .21 | .22 | .08* | - | - | .36 | .34 | .33 | .36 | .37 | .36 | - | - | - | - | - | .32* | .32 |
| Upland | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | .48 | .51 | .39 | - | - | - | - | - | - | -/ | .36 | .32 | .33 |
| Upland-ARB | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | .51 | .44 | .41 | .38* | .38 | .35 | .37 | .44 | .36. | - | - | - | - |
| Fontana | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | .42* | .49 | .38 | .38 | .39 | .42 | .42 | .42 | .35/ | .31 | .32 | .32 | .34 |
| Big Bear | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | .13* | .27 | .14* | .15 | .22 | .17 | - | - | - | - | - | - | .26 |
| Lake Gregory | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | .13* | .26* | .27 | .23 | .32 | .33 | .40 | .31 | .35 | .32 | .28 | .34 | .30 |
| Yucaipa | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | .20* | .28* | .29 | .32 | .33 | - | .33 | .27* | - | - | - | - |
| Twenty-Nine Palms | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | .11* | .13 | .12 | .15 | .13 | - | - | - |

* Data may not be representative.

/ Station location change.

◯ District annual maximum 1-hour.

## TABLE X

## TEN LARGEST U.S. URBAN AREAS

## COMPARISON OF 1985 MAXIMA AND EXCEEDANCES OF FEDERAL STANDARDS

| Urban Area/County(ies)/State | 1980 Urban Area Population | Ozone | | Carbon Monoxide | | Nitrogen Dioxide | | Sulfur Dioxide | | Total Suspended Particulate | | Lead | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Max 1-Hr. | Days > .12 ppm | Max 8-Hr. | Days ≥ 9.3 ppm | Max 1-Hr. | AAM | Max 1-Hr. | AAM | Max 24-Hr. | AGM | Max Qtr. | Qtr. > 1.5 $ug/m^3$ |
| New York/Kings, Queens, New York, Bronx, Richmond/New York | 9,119,737 | .192 | 12 | 17.7 | 112 | .264 | .042 | .175 | .022 | 129 | 70 | .60 | 0 |
| Los Angeles/Los Angeles/California | 7,477,657 | .370 | 117 | 27.9 | 76 | .349 | .0599 | .081 | .009 | 257 | 119 | .63 | 0 |
| Chicago/Cook/Illinois | 7,102,328 | .148 | 4 | 8.4 | NA | .166 | .042 | .611 | .019 | 545 | 85 | 1.48 | 0 |
| Philadelphia/Philadelphia/Pennsylvania | 4,716,818 | .190 | 11 | 8.4 | NA | .179 | .036 | .162 | .017 | 160 | 74 | 2.07 | 3 |
| Detroit/Wayne/Michigan | 4,352,762 | .106 | NA | 8.6 | NA | .114 | .021 | .206 | .014 | 452 | 112 | .43 | 0 |
| San Francisco/San Francisco/California | 3,252,721 | .090 | NA | 15.1 | 4 | .179 | .028 | .071 | .003 | 158 | 62 | .26 | 0 |
| Washington/District of Columbia | 3,060,240 | .149 | 3 | 10.5 | 1 | .119 | .037 | .107 | .013 | 237 | 67 | .21 | 0 |
| Dallas-Fort Worth/Dallas, Tarrant/Texas | 2,974,878 | .170 | 6 | 10.9 | 2 | .150 | .022 | .152 | .005 | 448 | 70 | 1.25 | 0 |
| Houston/Harris/Texas | 2,905,350 | .290 | 21 | 8.7 | NA | .150 | .029 | .437 | .009 | 435 | 81 | .26 | 0 |
| Boston/Suffolk/Massachusetts | 2,763,357 | .129 | 1 | 8.8 | NA | .160 | .040 | .253 | .013 | 160 | 81 | .43 | 0 |

Max 1 = maximum 1-hour average in ppm. Max 24 = maximum 24-hour average in $ug/m^3$.

Days >.12 = number of days maximum 1-hour average $O_3 > .125$ ppm. Days ≥ 9.3 = number of days max. 8-hour CO ≥ 9.3 ppm (10 $mg/m^3$.)

AAM = annual average (arithmetic mean). AGM = annual average (geometric mean).

NA = data not available.

Source of data: Environmental Protection Agency.

## TABLE XI

### FIVE WORST U.S. COUNTIES VERSUS WORST BASIN COUNTY
### COMPARISON OF 1985 MAXIMA AND EXCEEDANCES OF FEDERAL STANDARDS

| Contaminant and Federal Standard | Five Worst U.S. Counties Vs Worst Basin County* | Number of Days Exceeding Federal Standards | Five Worst U.S. Counties Vs Worst Basin County* | Max 1-hour or Max. 24-hour Average Concentrat |
|---|---|---|---|---|
| Ozone $O_3$ | 1. San Bernardino*/California | 126 | 1. Los Angeles*/California | .37 ppm |
| 0.12 ppm | 2. Riverside*/California | 125 | 2. Riverside*/California | .35 ppm |
| (240 ug/m$^3$) | 3. Los Angeles*/California | 117 | San Bernardino*/California | .35 ppm (1- |
| 1-Hr. Avg. | 4. Orange County*/California | 57 | 3. Harris /Texas | .29 ppm |
| | 5. San Diego/California | 33 | 4. Santa Barbara, San Diego/California | .22 ppm |
| | | | 5. Middlesex/Connecticut | .219 ppm |
| Carbon | 1. New York/New York | 112 | 1. Los Angeles*/California | 27.9 ppm |
| Monoxide, CO | 2. Los Angeles*/California | 76 | 2. Denver/Colorado | 24.8 ppm |
| 9.3 ppm | 3. Clark/Nevada | 58 | 3. Washoe/Nevada | 23.8 ppm (8- |
| (10 mg/m$^3$) | 4. Kings/New York | 44 | 4. Cascade/Montana | 22.7 ppm |
| 8-Hr. Avg. | 5. Jackson/Oregon | 43 | 5. Ramsey /Minnesota | 20.2 ppm |
| | Maricopa/Arizona | 43 | | |
| Sulfur | 1. Ononodaga/New York | 11 | 1. Allegheny/Pennsylvania | .34 ppm |
| Dioxide, $SO_2$ | 2. Clinton/Iowa | 8 | 2. Onondaga/New York | .31 ppm |
| 0.14 ppm | 3. Bannock, Caribou/Idaho | 3 | 3. Lee/Iowa | .29 ppm (24. |
| (365 ug/m$^3$) | Lee/Iowa | 3 | 4. Warrick/Indiana | .25 ppm |
| 24-Hr. Avg. | 4. Polk/Tennessee | 2 | 5. Allegheny/Pennsylvania | .24 ppm |
| | Allegheny/Pennsylvania | 2 | | |
| | Oneida/Wisconsin | 2 | Los Angeles*/California | .03 ppm |
| | Gila/Arizona | 2 | | |
| | 5. Pinal/Arizona | 1 | | |
| | Gibson Lake, Marion, Warrick/Indiana | 1 | | |
| | Story/Iowa | 1 | | |
| | Yellowstone/Montana | 1 | | |
| | Tuscarawas/Ohio | 1 | | |
| | Brown, Marinette/Wisconsin | 1 | | |
| | South Coast Air Basin | None | | |
| Total | 1. Inyo/California | 19 | 1. Inyo/California | 7628 ug/m$^3$ |
| Suspended | 2. Jackson/Oregon | 17 | 2. Dane/Wisconson | 1792 ug/m$^3$ |
| Particulate | 3. Denver/Colorado | 16 | 3. Cerro Gordo/Iowa | 1416 ug/m$^3$ (24-Hr.) |
| TSP | 4. Cochise/Arizona | 14 | 4. Yuma/Arizona | 1191 ug/m$^3$ |
| 260 ug/m$^3$ | 5. Cerro Gordo/Iowa | 13 | 5. Kings/California | 1092 ug/m$^3$ |
| 24-Hr. Avg. | | | | |
| | Riverside*/California | 3 | San Bernardino*/California | 393 ug/m$^3$ |
| | San Bernardino*/California | 3 | | |
| | | Annual Arithmetic Mean | | |
| Nitrogen | 1. Los Angeles*/California | .0599 ppm | 1. Nassau/New York | .45 ppm |
| Dioxide, $NO_2$ | 2. Denver/Colorado | .047 ppm | 2. Clark/Nevada | .41 ppm |
| 0.05 ppm | 3. Orange*/California | .043 ppm | 3. Los Angeles*/California | .35 ppm |
| (100 ug/m$^3$) | Union/New Jersey | .043 ppm | Adams/Colorado | .35 ppm (1-Hr.) |
| AAM | 4. Cook/Illinois | .042 ppm | 4. Orange*/California | .30 ppm |
| | New York/New York | .042 ppm | New Castle/Delaware | .30 ppm |
| | 5. Suffolk/Massachusetts | .040 ppm | 5. Bronx/New York | .26 ppm |
| | | Number Qtrs. Exceeding | | |
| Lead, Pb | 1. Lewis and Clark/Montana | 4 ppm | | Max. Qtly. Avg. |
| 1.5 ug/m$^3$ | 2. Lake/Indiana | 3 | 1. Lewis and Clark/Montana | 5.46 ug/m$^3$ |
| Quarterly | Jefferson/Missouri | 3 | 2. El Paso/Texas | 3.25 ug/m$^3$ |
| Avg. | Philadelphia/Pennsylvania | 3 | 3. Iron/Missouri | 2.38 ug/m$^3$ |
| | 3. Iron/Missouri | 2 | 4. Philadelphia/Pennsylvania | 2.07 ug/m$^3$ |
| | 4. Marion/Indiana | 1 | 5. Lakes/Indiana | 2.01 ug/m$^3$ |
| | Collin, El Paso/Texas | 1 | Collin/Texas | 2.01 ug/m$^3$ |
| | South Coast Air Basin | None | Los Angeles*/California | 0.63 ug/m$^3$ |

*South Coast Air Basin

Source of data: Environmental Protection Agency.

## TABLE XII
## CARBON MONOXIDE - 1985
### Comparison to Air Quality Criteria

| Station No., Location | Days State Std 1-Hr Avg >20 ppm | Number of Days in 1985 Max. 8-Hr Avg. Exceeded: State Std >=9.1 ppm | Old Fed Std >=9.3 ppm | New Fed Std >=9.5 ppm | Fed Alert >=15 ppm | Max 1-Hr ppm | Max 8-Hr ppm | Ann Avg | Total Number Days |
|---|---|---|---|---|---|---|---|---|---|
| 600 Azusa | 0 | 0 | 0 | 0 | 0 | 9 | 4.88 | 1.17 | 365 |
| 690 Burbank | 1 | 16 | 15 | 15 | 1 | 21 | 16.14 | 2.76 | 365 |
| 720 Long Beach | 0 | 6 | 6 | 6 | 1 | 19 | 15.71 | 1.72 | 365 |
| 740 Reseda | 0 | 9 | 9 | 9 | 0 | 16 | 14.14 | 2.01 | 365 |
| 750 Pomona | 0 | 0 | 0 | 0 | 0 | 12 | 7.43 | 1.91 | 365 |
| 760 Lennox | 12 | 51 | 46 | 45 | 8 | 29 | 24.00 | 3.58 | 363 |
| 800 Whittier | 0 | 4 | 3 | 3 | 0 | 18 | 14.57 | 1.71 | 365 |
| 820 Lancaster** | 0 | 0 | 0 | 0 | 0 | 12 | 5.71 | .71 | 364 |
| 840 Lynwood | 12 | 36 | 32 | 32 | 10 | 33 | 27.71 | 2.66 | 364 |
| 850 Pico Rivera | 0 | 5 | 3 | 3 | 0 | 19 | 13.14 | 1.87 | 365 |
| 870 Los Angeles | 0 | 2 | 1 | 1 | 0 | 14 | 9.86 | 2.21 | 365 |
| 880 Pasadena | 0 | 3 | 3 | 3 | 0 | 17 | 11.29 | 2.02 | 364 |
| 890 Newhall | | | | | | | | | |
| 910 West L.A., VA. | 0 | 0 | 0 | 0 | 0 | 15 | 6.86 | 1.24 | 359 |
| 591 Glendora | | | | | | | | | |
| 3176 Anaheim | 0 | 4 | 3 | 2 | 1 | 19 | 17.00 | 1.56 | 365 |
| 3177 La Habra | 2 | 5 | 4 | 4 | 0 | 22 | 14.00 | 2.29 | 365 |
| 3186 El Toro | 0 | 0 | 0 | 0 | 0 | 10 | 7.71 | 1.08 | 363 |
| 3188 San Juan Cap. | | | | | | | | | |
| 3190 Los Alamitos | | | | | | | | | |
| 3192 Costa Mesa | 0 | 5 | 4 | 4 | 0 | 19 | 13.29 | 1.13 | 365 |
| 4137 Palm Springs** | 0 | 0 | 0 | 0 | 0 | 5 | 2.57 | .50 | 356 |
| 4141 Hemet | | | | | | | | | |
| 4144 Rubidoux | 0 | 0 | 0 | 0 | 0 | 8 | 5.71 | 1.19 | 365 |
| 4149 Perris | | | | | | | | | |
| 4150 Banning** | | | | | | | | | |
| 4155 Norco | | | | | | | | | |
| 4139 Indio** | | | | | | | | | |
| 5171 Ontario | | | | | | | | | |
| 5175 Upland | 0 | 0 | 0 | 0 | 0 | 10 | 6.33 | 1.52 | 364 |
| 5181 Crestline | | | | | | | | | |
| 5184 Big Bear | | | | | | | | | |
| 5192 Redlands | | | | | | | | | |
| 5194 San Bernardino | 0* | 0* | 0* | 0* | 0* | 9* | 5.29* | .96* | 234 |
| 5197 Fontana | 0 | 0 | 0 | 0 | 0 | 5 | 4.00 | 1.51 | 361 |
| 5198 Chino | | | | | | | | | |

*Less than 12 full months of data.
**Southeast Desert Air Basin.

Std = Standard. Max = Maximum.
Ann Avg = annual average (arithmetic mean) in ppm (parts per million by volume).
**Fed. Std.** = Federal standard. Changed from from >10 mg/m$^3$ ($\geq$9.3 ppm) to >9 ppm ($\geq$9.5 ppm), effective September 13, 1985.

## TABLE XIII
## NITROGEN DIOXIDE - 1985
### Comparison to Air Quality Criteria

| Station No., Location | Number of Days in 1985 Exceeding: State Standard 1-Hr Avg >=.25 ppm | Stage I Episode 24-Hr Avg >=.15 ppm | Max 1-Hr ppm | Max 24-Hr ppm | Ann Avg | Total Number Days |
|---|---|---|---|---|---|---|
| 600 Azusa | 1 | 0 | .27 | .120 | .0502 | 365 |
| 690 Burbank | 1 | 0 | .31 | .133 | .0571E | 360 |
| 720 Long Beach | 4 | 4 | .35 | .225 | .0499 | 365 |
| 740 Reseda | 0 | 0 | .21 | .111 | .0385 | 363 |
| 750 Pomona | 0 | 0 | .23 | .108 | .0541E | 365 |
| 760 Lennox | 0 | 1 | .24 | .174 | .0432 | 362 |
| 800 Whittier | 3 | 2 | .31 | .177 | .0479 | 365 |
| 820 Lancaster** | 0 | 0 | .08 | .036 | .0146 | 363 |
| 840 Lynwood | 1 | 2 | .31 | .187 | .0523 | 365 |
| 850 Pico Rivera | 4 | 1 | .31 | .152 | .0532 | 365 |
| 870 Los Angeles | 3 | 0 | .27 | .128 | .0599E | 363 |
| 880 Pasadena | 1 | 0 | .27 | .110 | .0501 | 364 |
| 890 Newhall | | | | | | |
| 910 West L.A., VA. | 0 | 0 | .23 | .100 | .0384 | 365 |
| 591 Glendora | | | | | | |
| 3176 Anaheim | 2 | 1 | .28 | .153 | .0430 | 365 |
| 3177 La Habra | 2 | 0 | .30 | .143 | .0426 | 365 |
| 3186 El Toro | | | | | | |
| 3188 San Juan Cap. | | | | | | |
| 3190 Los Alamitos | | | | | | |
| 3192 Costa Mesa | 0 | 0 | .24 | .139 | .0248 | 365 |
| 4137 Palm Springs** | 0 | 0 | .08 | .046 | .0196 | 364 |
| 4141 Hemet | | | | | | |
| 4144 Rubidoux | 0 | 0 | .16 | .093 | .0353 | 358 |
| 4149 Perris | | | | | | |
| 4150 Banning** | | | | | | |
| 4155 Norco | | | | | | |
| 4139 Indio** | | | | | | |
| 5175 Upland | 0 | 0 | .18 | .078 | .0398 | 365 |
| 5181 Crestline | | | | | | |
| 5184 Big Bear | | | | | | |
| 5192 Redlands | | | | | | |
| 5194 San Bernardino | 0* | 0* | .15* | .073* | .0379* | 234 |
| 5197 Fontana | 0 | 0 | .14 | .076 | .0373 | 363 |
| 5198 Chino | | | | | | |

*Less than 12 full months of data.
**Southeast Desert Air Basin.

Max = Maximum. Fed = Federal. Std = Standard.

Ann Avg = annual average (arithmetic mean) in ppm (parts per million by volume).
E = exceeds federal standard (annual average arithmetic mean $NO_2$ >.0534 ppm.) The federal $NO_2$ standard was changed from >100 ug/m$^3$ (>.0532 ppm) to >.053 ppm (>.0534 ppm), effective July 1, 1985.

## TABLE XIV
## SULFUR DIOXIDE - 1985
### Comparison to Air Quality Criteria

| Station No., Location | Number of days in 1985 Exceeding: State Standard 1-Hr Avg >.25 ppm | Number of days in 1985 Exceeding: Stage I Episode 24-Hr Avg >.14 ppm | Max 1-Hr ppm | Max 24-Hr ppm | Ann Avg | Total Number Days |
|---|---|---|---|---|---|---|
| 600 Azusa | 0 | 0 | .02 | .010 | .0029 | 365 |
| 690 Burbank | 0 | 0 | .04 | .017 | .0051 | 365 |
| 720 Long Beach | 0 | 0 | .08 | .031 | .0081 | 365 |
| 740 Reseda | 0 | 0 | .02 | .015 | .0025 | 359 |
| 750 Pomona | | | | | | |
| 760 Lennox | 0* | 0* | .06* | .024* | .0074* | 312 |
| 800 Whittier | 0 | 0 | .05 | .021 | .0043 | 365 |
| 820 Lancaster** | | | | | | |
| 840 Lynwood | 0 | 0 | .06 | .031 | .0070 | 346 |
| 850 Pico Rivera | 0 | 0 | .07 | .023 | .0050 | 363 |
| 870 Los Angeles | 0 | 0 | .04 | .021 | .0053 | 364 |
| 880 Pasadena | 0 | 0 | .03 | .011 | .0025 | 365 |
| 890 Newhall | | | | | | |
| 910 West L.A , VA. | 0 | 0 | .03 | .012 | .0032 | 365 |
| 591 Glendora | | | | | | |
| 3176 Anaheim | 0 | 0 | .03 | .015 | .0032 | 365 |
| 3177 La Habra | 0 | 0 | .05 | .017 | .0051 | 365 |
| 3186 El Toro | | | | | | |
| 3188 San Juan Cap. | | | | | | |
| 3190 Los Alamitos | 0 | 0 | .02 | .018 | .0030 | 364 |
| 3192 Costa Mesa | 0 | 0 | .05 | .015 | .0028 | 363 |
| 4137 Palm Springs** | | | | | | |
| 4139 Indio** | | | | | | |
| 4141 Hemet | | | | | | |
| 4144 Rubidoux | 0 | 0 | .02 | .010 | .0014 | 361 |
| 4149 Perris | | | | | | |
| 4150 Banning** | | | | | | |
| 4155 Norco | | | | | | |
| 4157 Indio** | | | | | | |
| 5175 Upland | 0 | 0 | .02 | .008 | .0008 | 365 |
| 5181 Crestline | | | | | | |
| 5184 Big Bear | | | | | | |
| 5192 Redlands | | | | | | |
| 5194 San Bernardino | 0* | 0* | .02* | .008* | .0017* | 219 |
| 5197 Fontana | 0 | 0 | .02 | .008 | .0010 | 355 |
| 5198 Chino | | | | | | |

*Less than 12 full months of data.
**Southeast Desert Air Basin.

Max = Maximum.
Ann Avg = annual average (arithmetic mean) in ppm (parts per million by volume).

## TABLE XV
## TOTAL SUSPENDED PARTICULATE(TSP) - 1985
### Comparison to Federal Standards, Annual Maximum, Annual Average, $ug/m^3$

| Station No., Location | Number Days | | Percent Days | | Max 24-Hr Avg | Ann Avg | Days Sampled |
|---|---|---|---|---|---|---|---|
| | ≥150 | ≥260 | ≥150 | ≥260 | | | |
| 600 Azusa | 9 | 1 | 15% | 2% | 227 | 95 | 61 |
| 690 Burbank | 4 | 0 | 7% | 0% | 246 | 92 | 59 |
| 720 Long Beach | 2 | 0 | 3% | 0% | 244 | 83 | 59 |
| 740 Reseda | 3 | 1 | 5% | 2% | 392 | 68 | 59 |
| 750 Pomona | | | | | | | |
| 760 Lennox | 3 | 1 | 6% | 2% | 283 | 78 | 48 |
| 800 Whittier | | | | | | | |
| 820 Lancaster** | 1 | 1 | 2% | 2% | 316 | 71 | 55 |
| 840 Lynwood | 6 | 1 | 11% | 2% | 290 | 104 | 55 |
| 850 Pico Rivera | 4 | 0 | 7% | 0% | 232 | 96 | 60 |
| 870 Los Angeles | 2 | 0 | 3% | 0% | 208 | 93 | 58 |
| 880 Pasadena | 1 | 0 | 2% | 0% | 162 | 75 | 55 |
| 890 Newhall | | | | | | | |
| 910 West L.A., VA. | 1 | 1 | 2% | 2% | 291 | 58 | 61 |
| 591 Glendora | 1 | 0 | 2% | 0% | 184 | 69 | 60 |
| 3176 Anaheim | 3 | 0 | 5% | 0% | 215 | 88 | 60 |
| 3177 La Habra | 4 | 0 | 8% | 0% | 254 | 91 | 49 |
| 3186 El Toro | 1 | 0 | 2% | 0% | 183 | 70 | 59 |
| 3190 Los Alamitos | 5 | 0 | 9% | 0% | 227 | 93 | 58 |
| 3192 Costa Mesa | | | | | | | |
| 4137 Palm Springs** | 7 | 1 | 11% | 2% | 291 | 74 | 61 |
| 4139 Indio** | 8 | 3 | 13% | 5% | 606 | 102 | 60 |
| 4144 Rubidoux, RIVR | 29 | 4 | 48% | 7% | 335 | 132 | 61 |
| 4146 Riverside, Mag. | 15 | 0 | 25% | 0% | 229 | 108 | 61 |
| 4149 Perris | 7 | 0 | 12% | 0% | 201 | 88 | 59 |
| 4150 Banning** | 4 | 0 | 7% | 0% | 177 | 66 | 59 |
| 4155 Norco | | | | | | | |
| 5155 Barstow** | 0 | 0 | 0% | 0% | 135 | 62 | 59 |
| 5171 Ontario | 16 | 1 | 26% | 2% | 292 | 110 | 61 |
| 5175 Upland | 6 | 0 | 10% | 0% | 208 | 92 | 60 |
| 5181 Crestline | 0 | 0 | 0% | 0% | 150 | 51 | 60 |
| 5184 Big Bear | 0 | 0 | 0% | 0% | 147 | 51 | 28 |
| 5188 Trona** | 12 | 3 | 21% | 5% | 393 | 109 | 56 |
| 5190 Victorville** | 4 | 2 | 7% | 4% | 271 | 87 | 55 |
| 5191 29 Palms** | 1 | 0 | 2% | 0% | 190 | 50 | 61 |
| 5192 Redlands | 18 | 1 | 30% | 2% | 280 | 95 | 60 |
| 5194 San Bernardino | 23 | 1 | 38% | 2% | 277 | 109 | 60 |
| 5197 Fontana | 22 | 2 | 36% | 3% | 312 | 101 | 61 |
| 5198 Chino | 18 | 0 | 31% | 0% | 252 | 124 | 59 |

*Less than 12 full months of data.

**Southeast Desert Air Basin. Stations in San Bernardino County are operated by San Bernardino County APCD.

Number(Percent) Days = the number(percent) of days exceeding the federal secondary and primary standard levels, 150 $ug/m^3$ and 260 $ug/m^3$ (micrograms per cubic meter)

Max 24-Hr Avg = maximum 24-hour average concentration of TSP in $ug/m^3$.

Ann Avg = annual average (geometric mean) TSP in $ug/m^3$.

## TABLE XVI

### PM10 - 1985

### Comparison to State/Proposed Federal Standards, Annual Maximum/Average

| Station No., Location | Number Days >50 | Number Days >150 | Percent Days >50 | Percent Days >150 | Max 24-Hr Avg | Annual Average A/G | Days Sampled |
|---|---|---|---|---|---|---|---|
| 600 Azusa | 41 | 0 | 68% | 0% | 149 | 67/59 | 60 |
| 690 Burbank | 46 | 1 | 77% | 2% | 165 | 70/65 | 60 |
| 720 Long Beach | 29 | 0 | 53% | 0% | 106 | 55/52 | 55 |
| 740 Reseda | | | | | | | |
| 750 Pomona | | | | | | | |
| 760 Lennox | | | | | | | |
| 800 Whittier | | | | | | | |
| 820 Lancaster** | | | | | | | |
| 840 Lynwood | | | | | | | |
| 850 Pico Rivera | | | | | | | |
| 870 Los Angeles | 37* | 0* | 80%* | 0%* | 146* | 70/66* | 46 |
| 880 Pasadena | | | | | | | |
| 890 Newhall | | | | | | | |
| 910 West L.A., VA. | | | | | | | |
| 591 Glendora | | | | | | | |
| 3176 Anaheim | | | | | | | |
| 3177 La Habra | | | | | | | |
| 3186 El Toro | 22 | 0 | 37% | 0% | 100 | 47/43 | 59 |
| 3190 Los Alamitos | 34 | 0 | 57% | 0% | 144 | 56/52 | 60 |
| 3192 Costa Mesa | | | | | | | |
| 4137 Palm Springs** | | | | | | | |
| 4144 Rubidoux, RIVR | 46 | 11 | 75% | 18% | 208 | 96/81 | 61 |
| 4146 Riverside, Mag. | | | | | | | |
| 4149 Perris | | | | | | | |
| 4150 Banning** | 27 | 0 | 50% | 0% | 135 | 51/40 | 54 |
| 4155 Norco | | | | | | | |
| 4157 Indio** | 37 | 3 | 65% | 5% | 358 | 68/55 | 57 |
| 5171 Ontario | 42 | 1 | 70% | 2% | 157 | 74/65 | 60 |
| 5175 Upland | | | | | | | |
| 5181 Crestline | | | | | | | |
| 5184 Big Bear | | | | | | | |
| 5192 Redlands | | | | | | | |
| 5194 San Bernardino | | | | | | | |
| 5197 Fontana | 9* | 1* | 60%* | 7%* | 154* | 74/63* | 15 |
| 5198 Chino | | | | | | | |

*Less than 12 full months of data.
**Southeast Desert Air Basin.

PM10 = particulate matter less than 10 um (micrometer), by SSI method.

Number Days >50(150) = the number of days on which the state PM10 standard (24-hr avg PM10 >50 ug/$m^3$) and the lower limit of proposed federal standard (24-hr avg >150 ug/$m^3$) were exceeded.

Percent days >50(150) = the percent of days on which the state or lower limit of proposed federal standards were exceeded.

Max 24-hr Avg = maximum 24-hour average PM10 concentration of the year in ug/$m^3$ (micrograms per cubic meter).

A/G = arithmetic mean/geometric mean PM10 in ug/$m^3$.

State annual standard is annual geometric mean >30 ug/$m^3$.

Lower limit of range of proposed federal standard is arithmetic mean >50 ug/$m^3$.

## TABLE XVII
## LEAD - 1985
### Comparison to State/Federal Standards, Annual Maximum, Annual Average

| Station No., Location | Number Months >=1.5 | Maximum Monthly Average | Number Quarters >1.5 | Maximum Quarterly Average | Annual Average | Days Sampled |
|---|---|---|---|---|---|---|
| 600 Azusa | 0 | .25 | 0 | .21 | .19 | 61 |
| 690 Burbank | 0 | .60 | 0 | .49 | .31 | 59 |
| 720 Long Beach | 0 | .52 | 0 | .36 | .23 | 59 |
| 740 Reseda | 0 | .32 | 0 | .27 | .19 | 59 |
| 750 Pomona | | | | | | |
| 760 Lennox | 0* | .90* | 0* | .60* | .31* | 48 |
| 800 Whittier | | | | | | |
| 820 Lancaster** | 0 | .18 | 0 | .13 | .09 | 55 |
| 840 Lynwood | 0 | .91 | 0 | .63 | .35 | 55 |
| 850 Pico Rivera | 0 | .65 | 0 | .49 | .34 | 60 |
| 870 Los Angeles | 0 | .61 | 0 | .47 | .31 | 58 |
| 880 Pasadena | 0 | .38 | 0 | .29 | .20 | 55 |
| 890 Newhall | | | | | | |
| 910 West L.A , VA | 0 | .33 | 0 | .26 | .16 | 61 |
| 591 Glendora | | | | | | |
| 3176 Anaheim | 0 | .32 | 0 | .27 | .20 | 60 |
| 3177 La Habra | 0* | .44* | 0* | .33* | .21* | 49 |
| 3186 El Toro | 0 | .20 | 0 | .15 | .11 | 59 |
| 3190 Los Alamitos | 0 | .39 | 0 | .31 | .17 | 58 |
| 3192 Costa Mesa | | | | | | |
| 4137 Palm Springs** | 0 | .13 | 0 | .10 | .06 | 61 |
| 4144 Rubidoux, RIVR | 0 | .27 | 0 | .21 | .16 | 61 |
| 4146 Riverside, Mag. | 0 | .37 | 0 | .30 | .22 | 61 |
| 4149 Perris | 0 | .18 | 0 | .13 | .10 | 59 |
| 4150 Banning** | 0 | .10 | 0 | .08 | .07 | 59 |
| 4155 Norco | | | | | | |
| 4157 Indio** | 0 | .19 | 0 | .14 | .09 | 60 |
| 5155 Barstow** | 0 | .12 | 0 | .09 | .06 | 59 |
| 5171 Ontario | 0 | .36 | 0 | .26 | .18 | 61 |
| 5175 Upland | 0 | .26 | 0 | .23 | .17 | 60 |
| 5181 Crestline | 0 | .12 | 0 | .07 | .07 | 60 |
| 5184 Big Bear | | | | | | |
| 5188 Trona** | 0 | .12 | 0 | .07 | .07 | 56 |
| 5190 Victorville** | 0 | .12 | 0 | .09 | .08 | 55 |
| 5191 29 Palms** | 0 | .08 | 0 | .05 | .04 | 61 |
| 5192 Redlands | 0 | .19 | 0 | .15 | .12 | 60 |
| 5194 San Bernardino | 0 | .31 | 0 | .20 | .17 | 60 |
| 5197 Fontana | 0 | .22 | 0 | .17 | .15 | 61 |
| 5198 Chino | | | | | | |

*Less than 12 full months of data.
**Southeast Desert Air Basin. Stations in San Bernardino County are operated by San Bernardino County APCD.

Number months (quarters) = the number of months (quarters) exceeding the state (federal) standard for lead, monthly average lead concentration>= 1.5 ug/m$^3$ (quarterly average lead>1.5 ug/m$^3$).
Maximum monthly average = the annual maximum monthly average lead concentration in ug/m$^3$ (micrograms per cubic meter).
Maximum quarterly average = highest quarterly average lead concentration of the year in ug/m$^3$.
Annual Average = annual average (arithmetic mean) lead concentration in ug/m$^3$.

**TABLE XVIII**
**SULFATE - 1985**
**Comparison to State Standard, Annual Maximum, Annual Average**

| Station No., Location | Annual Number Days >=25 | Percent Days >=25 | Maximum Daily Average | Annual Average | Days Sampled |
|---|---|---|---|---|---|
| 600 Azusa | 0 | 0% | 15.4 | 6.78 | 61 |
| 690 Burbank | 0 | 0% | 21.6 | 8.33 | 59 |
| 720 Long Beach | 1 | 2% | 31.0 | 9.36 | 59 |
| 740 Reseda | 0 | 0% | 19.0 | 6.58 | 59 |
| 750 Pomona | | | | | |
| 760 Lennox | 0* | 0%* | 24.4* | 9.78* | 48 |
| 800 Whittier | | | | | |
| 820 Lancaster** | 0 | 0% | 7.6 | 3.65 | 55 |
| 840 Lynwood | 0 | 0% | 24.0 | 8.71 | 55 |
| 850 Pico Rivera | 0 | 0% | 19.2 | 8.62 | 60 |
| 870 Los Angeles | 0 | 0% | 20.0 | 8.32 | 58 |
| 880 Pasadena | 0 | 0% | 20.9 | 7.57 | 55 |
| 890 Newhall | | | | | |
| 910 West L.A., VA. | 0 | 0% | 22.5 | 7.77 | 61 |
| 591 Glendora | 0 | 0% | 14.9 | 6.49 | 60 |
| 3176 Anaheim | 0 | 0% | 19.4 | 7.79 | 60 |
| 3177 La Habra | 0* | 0%* | 22.8* | 7.54* | 49 |
| 3186 El Toro | 0 | 0% | 21.2 | 6.09 | 59 |
| 3190 Los Alamitos | 0 | 0% | 22.4 | 7.61 | 58 |
| 3192 Costa Mesa | | | | | |
| 4137 Palm Springs** | 0 | 0% | 9.1 | 3.90 | 61 |
| 4144 Rubidoux, RIVR | 0 | 0% | 21.0 | 7.71 | 61 |
| 4146 Riverside, Mag. | 0 | 0% | 21.1 | 7.13 | 61 |
| 4149 Perris | 0 | 0% | 14.1 | 5.34 | 59 |
| 4150 Banning | 0 | 0% | 12.3 | 5.07 | 59 |
| 4155 Norco | | | | | |
| 4157 Indio** | 0 | 0% | 8.4 | 4.50 | 60 |
| 5155 Barstow** | 0 | 0% | 6.8 | 4.07 | 59 |
| 5171 Ontario | 0 | 0% | 18.5 | 7.68 | 61 |
| 5175 Upland | 0 | 0% | 15.3 | 6.74 | 60 |
| 5181 Crestline | 0 | 0% | 7.1 | 3.24 | 60 |
| 5184 Big Bear | 0* | 0%* | 4.8* | 2.28* | 28 |
| 5188 Trona** | 1 | 2% | 42.7 | 10.54 | 56 |
| 5190 Victorville** | 0 | 0% | 8.1 | 4.58 | 55 |
| 5191 29 Palms** | 0 | 0% | 6.0 | 2.42 | 61 |
| 5192 Redlands | 0 | 0% | 16.2 | 6.22 | 60 |
| 5194 San Bernardino | 0 | 0% | 19.4 | 6.64 | 60 |
| 5197 Fontana | 0 | 0% | 16.4 | 6.63 | 61 |
| 5198 Chino | 0 | 0% | 17.5 | 7.40 | 59 |

*Less than 12 full months of data.
**Southeast Desert Air Basin. Stations in San Bernardino County are operated by San Bernardino County APCD.

Number(Percent) Days = number(percent) of days exceeding the state sulfate standard (24-hour average sulfate >= 25 ug/m$^3$).
Annual Maximum Daily Average = single highest 24-hour average sulfate concentration of the year in ug/m$^3$ (micrograms per cubic meter).
Annual Average = annual average arithmetic mean sulfate concentration in ug/m$^3$.

## TABLE XIX
## NITRATE - 1985
### Annual Average and Maximum

| Station No., Location | Maximum 24-hour Average | Annual Average | Days Sampled |
|---|---|---|---|
| 600 Azusa | 42.9 | 16.49 | 61 |
| 690 Burbank | 41.2 | 15.86 | 59 |
| 720 Long Beach | 32.4 | 11.43 | 59 |
| 740 Reseda | 39.0 | 10.78 | 59 |
| 750 Pomona | | | |
| 760 Lennox | 27.4* | 10.53* | 48 |
| 800 Whittier | | | |
| 820 Lancaster** | 13.6 | 6.52 | 55 |
| 840 Lynwood | 42.9 | 13.57 | 55 |
| 850 Pico Rivera | 38.7 | 15.69 | 60 |
| 870 Los Angeles | 35.2 | 15.32 | 58 |
| 880 Pasadena | 32.7 | 13.73 | 55 |
| 890 Newhall | | | |
| 910 West L.A., VA. | 28.7 | 11.02 | 61 |
| 591 Glendora | 38.2 | 15.48 | 60 |
| 3176 Anaheim | 58.7 | 13.98 | 60 |
| 3177 La Habra | 32.7* | 14.54* | 49 |
| 3186 El Toro | 24.0 | 10.12 | 59 |
| 3190 Los Alamitos | 30.2 | 11.14 | 58 |
| 3192 Costa Mesa | | | |
| 4137 Palm Springs** | 23.2 | 9.08 | 61 |
| 4144 Rubidoux, RIVR | 67.6 | 23.11 | 61 |
| 4146 Riverside, Mag. | 72.1 | 20.76 | 61 |
| 4149 Perris | 54.1 | 15.40 | 59 |
| 4150 Banning** | 52.1 | 14.34 | 59 |
| 4155 Norco | | | |
| 4157 Indio** | 25.3 | 8.77 | 60 |
| 5155 Barstow** | 12.5 | 6.28 | 59 |
| 5171 Ontario | 63.5 | 21.16 | 61 |
| 5175 Upland | 48.8 | 17.40 | 60 |
| 5181 Crestline | 24.3 | 9.00 | 60 |
| 5184 Big Bear | 8.2* | 3.43* | 28 |
| 5188 Trona** | 12.2 | 4.42 | 56 |
| 5190 Victorville** | 24.9 | 8.65 | 55 |
| 5191 29 Palms** | 11.1 | 4.19 | 61 |
| 5192 Redlands | 81.0 | 22.53 | 60 |
| 5194 San Bernardino | 74.9 | 20.48 | 60 |
| 5197 Fontana | 58.4 | 19.20 | 61 |
| 5198 Chino | 58.3 | 19.43 | 59 |

*Less than 12 full months of data.
**Southeast Desert Air Basin. Stations in San Bernardino County are operated by San Bernardino County APCD.

Maximum 24-hour Average = maximum 24-hour average nitrate concentration of the year in $ug/m^3$ (micrograms per cubic meter).
Annual Average = annual average (arithmetic mean) of daily average nitrate concentrations in $ug/m^3$.